

GAO

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DEFENSE LOGISTICS

Improvements Needed to Enhance DOD's Management Approach and Implementation of Item Unique Identification Technology



G A O

Accountability * Integrity * Reliability

Highlights of [GAO-12-482](#), a report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives

Why GAO Did This Study

IUID technology allows DOD to assign a unique number to an item and use that number to manage that item in a variety of logistics processes. In 2003, DOD began implementation of IUID and has estimated that it could improve the accountability and maintenance of its property and equipment and save from \$3 billion to \$5 billion per year. Also, integrating and sharing UII data across DOD's enterprise information systems could enable DOD to track equipment as it moves between its components. GAO evaluated the extent to which DOD has (1) incorporated key elements of best management practices into its framework for IUID implementation, (2) marked items with IUID labels, and (3) developed the capability to share UII data across DOD in its enterprise information systems. GAO reviewed documents, interviewed cognizant officials, and reviewed DOD and GAO key practices for its analysis.

What GAO Recommends

GAO is making nine recommendations for enhancing DOD's implementation of IUID. They include actions to improve DOD's management of IUID implementation through best practices; enable the components to report complete data for marking items with IUID labels; and enable the components to share UII data across DOD enterprise information systems. DOD concurred with eight recommendations and partially concurred with one related to updating estimated financial costs and benefits of IUID implementation. DOD stated it will continue to identify such costs, but GAO continues to believe that updating benefits is also important, as discussed more fully in the report.

View [GAO-12-482](#). For more information, contact Zina Merritt at (202) 512-5257 or merrittz@gao.gov.

DEFENSE LOGISTICS

Improvements Needed to Enhance DOD's Management Approach and Implementation of Item Unique Identification Technology

What GAO Found

The Department of Defense (DOD) has taken some steps to improve its approach to managing and implementing Item Unique Identification (IUID) technology, but has yet to incorporate some key elements of best management practices into its evolving framework for management of IUID implementation. These include internal controls and analysis of return on investment. DOD has included certain internal controls, such as defining key areas of authority for IUID implementation, and it is revising policy to incorporate IUID. However, DOD does not have performance measures, such as reliable schedules for predicting when its enterprise information systems will be able to manage items using IUID data, or a full estimate of IUID's cost and benefits. Without a management framework that includes such key practices, DOD has faced challenges in implementing IUID technology and may not be well positioned to achieve potential financial and nonfinancial benefits.

DOD's data on the number of items already in its inventory—legacy items—marked with IUID labels to date is incomplete and DOD lacks assurance that contractors are sufficiently marking newly-acquired items and government-furnished property. The military services mark legacy items and have reported marking more than 2 million items. However, DOD does not have complete information on the total number of legacy items its components have marked and must mark in the future; does not have a full set of quantifiable goals or interim milestones corresponding to its IUID marking criteria—such as certain items that cost \$5,000 or more—and does not use consistent criteria among its components to track progress. Without the components reporting complete and comparable data, DOD's ability to assess progress in marking legacy items will remain limited. Also, DOD does not have assurance that contractors are sufficiently marking newly-acquired items and government-furnished property. DOD reported that as of January 2012, over 2,500 contractors had marked or registered over 11 million items. However, DOD does not require the components to examine and report on all types of contracts that should include IUID marking clauses, nor does it have policies and procedures that provide for systematic assessment of the sufficiency of data contained in these items' labels. Hence, DOD cannot know the full extent to which contractors are supplying IUID labels with the data needed to track items.

DOD's ability to track and share unique item identifier (UII) data across components is hampered by the lack of full integration of data into components' enterprise information systems. DOD has made some progress but faces challenges as it proceeds with its integration plans. DOD is revising its supply chain management policy and guidance to include IUID use, but has not fully defined requirements for using UII data, nor developed complete, integrated master schedules for integrating IUID, DOD-wide and within components' systems. Such schedules enable agencies to predict the cost and timelines of their systems' development. Without such requirements and schedules, DOD cannot adequately predict when the systems will be able to use UII data, or whether DOD will meet its fiscal year 2015 goal for using UII data to manage items throughout their life cycle.

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Abbreviations

DASD(SCI)	Deputy Assistant Secretary of Defense for Supply Chain Integration
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
IT	information technology
IUID	item unique identification
ODASD(SCI)	Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology and Logistics
UUI	unique item identifier

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G A O

Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

May 3, 2012

The Honorable Randy Forbes
Chairman
The Honorable Madeleine Bordallo
Ranking Member
Subcommittee on Readiness
Committee on Armed Services
House of Representatives

The Department of Defense's (DOD) inventory contains tens of millions of items, and it is a DOD priority to provide effective accountability over equipment and inventory items.¹ One aspect of accountability is asset visibility, a key component of DOD's management of its supply chain. DOD describes asset visibility as the ability to provide timely and accurate information on the location, quantity, condition, movement, and status of items in its inventory.² Limitations in asset visibility—such as a lack of interoperability among information technology (IT) systems, or challenges in instituting new technologies for tracking assets³—make it difficult to obtain this information in a timely and accurate fashion. One of the tools that DOD plans to use to improve asset visibility is a technology called item unique identification (IUID). This technology allows DOD to assign a unique number to an individual item and then use that unique number to manage that item in a variety of logistics processes. For example, according to DOD, tracking assets with IUID technology could enhance logistical efficiency and improve DOD's visibility of these assets. We have long reported that DOD supply chain management is a high-risk area, due in part to ineffective and inefficient inventory management practices and procedures, and challenges in achieving widespread implementation of

¹Office of the Under Secretary of Defense (Comptroller) and Chief Financial Officer, *Financial Improvement and Audit Readiness Guidance* (Washington, D.C.: Dec. 2011).

²GAO, *Defense Logistics: DOD Needs to Take Additional Actions to Address Challenges in Supply Chain Management*, [GAO-11-569](#) (Washington, D.C.: July 28, 2011).

³[GAO-11-569](#).

key technologies aimed at improving asset visibility.⁴ We have also previously reported on challenges DOD has faced in instituting new technologies for improving asset visibility,⁵ and with current technology and processes DOD continues to have difficulties in systematically identifying and managing individual items throughout their life cycles.

In 2003, the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics issued DOD's first policy on IUID technology, directing DOD components—the Army, Navy, Marine Corps, Air Force, and Defense Logistics Agency⁶—to include IUID marking requirements in contracts for certain types of items. In 2004, this office established the requirement for DOD components to mark items already in their inventories—known as legacy items⁷—with IUID labels.⁸ Contractors and components mark items with IUID by placing a label on the item.⁹ IUID

⁴GAO, *High-Risk Series: An Update*, [GAO-11-278](#) (Washington, D.C.: Feb. 16, 2011). The title of this high-risk area was initially “DOD inventory management.” Subsequently, our work demonstrated that the problems adversely affecting support to the warfighter extended beyond DOD's inventory management system to involve the entire supply chain. As a result, we subsequently modified the title to “DOD supply chain management.”

⁵GAO, *Defense Logistics: Efforts to Improve Distribution and Supply Support for Joint Military Operations Could Benefit from a Coordinated Management Approach*, [GAO-07-807](#) (Washington, D.C.: June 29, 2007).

⁶In this report, we are addressing IUID implementation efforts carried out by the Army, Navy, Marine Corps, Air Force, and Defense Logistics Agency. According to DOD, these five components manage the majority of the items it plans to mark with IUID labels.

⁷For the purposes of this report, we have separated qualifying items into two categories: legacy items and contractor-marked items. Items are marked with IUID labels either by DOD components or by contractors. If an item qualifies for IUID marking, the DOD components are responsible for marking the item if it is currently in their inventory (legacy items), while contractors are responsible for marking the item if they are delivering it to DOD, or are using property furnished to them by the government (contractor-marked items).

⁸Principal Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics memorandum, *Policy for Unique Identification (UID) of Tangible Personal Property Legacy Items in Inventory and Operational Use, Including Government Furnished Property (GFP)* (Dec. 23, 2004).

⁹For the purposes of this report, “IUID label” is used to refer to the following labeling processes: embedding information directly to the item's surface, affixing through a data plate directly to the item, or printing on a label that is attached to the item. These labels vary in size and material, depending on the item to which they are attached and the durability they require to withstand the environmental conditions to which the item will be exposed.

labels contain information printed on them, and also encoded in a two-dimensional bar code image, referred to as a data matrix. These data matrices contain various pieces of information that—when combined—make up a globally unique string of numbers referred to as the item's unique item identifier (UII). DOD has established criteria for the types of items that are required to be marked with IUID labels.¹⁰ According to DOD, it has tens of millions of items in its inventory that meet these criteria. It is DOD's goal for its components to share UII data departmentwide, and the components are to use these data for tracking these items.

DOD has reported that the use of IUID could improve the accountability and maintenance of its components' property and equipment. For example, by sharing UII data across the components' IT systems, DOD could follow equipment as it moves between components. In addition, a component could use these data in its IT systems to more quickly identify items that require higher amounts of maintenance. By replacing such items with others that require normal amounts of maintenance, DOD could potentially save money. In addition, according to DOD's IUID Task Force (task force),¹¹ managing individual items by their unique identification numbers could save DOD an estimated \$3 billion to \$5 billion per year. In 2009, we noted that DOD had marked only a fraction of the millions of legacy items in its inventory that required IUID labels; had experienced delays in integrating IUID with its IT systems; and could not adequately track the money it had spent on IUID.¹² In response to your request, we are reporting on the current status of DOD's IUID implementation efforts. For this report, we are evaluating the extent to which DOD has (1) incorporated key elements of best management practices into its framework for IUID implementation; (2) marked legacy

¹⁰DOD Instruction 8320.04, *Item Unique Identification (IUID) Standards for Tangible Personal Property* (June 16, 2008). In 2010, the Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics revised certain aspects of the criteria in a memorandum entitled *Item Unique Identification (IUID) of Tangible Personal Property—Policy Refinement for Secondary Items in Use or in Inventory* (Dec. 30, 2010).

¹¹The task force was formed at the direction of the Joint Logistics Board on July 7, 2009, and was tasked to assess IUID implementation across DOD. The Joint Logistics Board provides advice and recommendations regarding joint logistics concerns and issues at the level of the Office of the Secretary of Defense.

¹²GAO, *Defense Logistics: Lack of Key Information May Impede DOD's Ability to Improve Supply Chain Management*, [GAO-09-150](#) (Washington, D.C.: Jan. 12, 2009).

items with IUID and taken steps to ensure that newly-acquired items and government-furnished property are sufficiently marked by contractors with IUID; and (3) developed the capability to share UII data across DOD in its enterprise information systems.

To determine the extent to which DOD has a comprehensive management approach for its implementation of IUID, we reviewed previously published DOD and GAO work to identify best management and cost-estimation practices.¹³ One of the best cost-estimation practices is that historical data are important for creating credible cost estimates. Because the task force used historical cost data in development of IUID cost estimates, we collected and reviewed the components' estimates of historical IUID spending. In addition, we collected and reviewed the components' fiscal year 2012 budget requests for IUID implementation, and the task force's analysis of the potential costs and benefits of IUID implementation. To determine the extent to which the DOD components have marked legacy items with IUID and taken steps to ensure that newly-acquired items and government-furnished property are sufficiently marked by contractors with IUID, we reviewed DOD's criteria for IUID marking and its plans for marking items. We also gathered data on the number of legacy items in components' inventories, and how many had been marked as of October 2011. In addition, we reviewed the Defense Federal Acquisition Regulation Supplement clauses that require contractors to mark or register newly-acquired items and government-furnished property, and we gathered data from DOD on contractor-marked items. To determine the extent to which DOD has developed the capability to share UII data across DOD in its enterprise information systems, we reviewed our previously published work on best practices for

¹³DOD, *Product Support Business Case Analysis Guidebook* (Washington, D.C.: April 2011); GAO, *Drug Control: DOD Needs to Improve Its Performance Measurement System to Better Manage and Oversee Its Counternarcotics Activities*, [GAO-10-835](#) (Washington, D.C.: July 21, 2010); GAO, *Cost Estimating and Assessment Guide*, [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009); GAO, *Afghanistan Security: U.S. Efforts to Develop Capable Afghan Police Forces Face Challenges and Need a Coordinated, Detailed Plan to Help Ensure Accountability*, [GAO-08-883T](#) (Washington, D.C.: June 18, 2008); GAO, *Tax Administration: IRS Needs to Further Refine Its Tax Filing Season Performance Measures*, [GAO-03-143](#) (Washington, D.C.: Nov. 22, 2002); GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: Nov. 1999); GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

developing schedules for these systems;¹⁴ reviewed existing schedules for these systems; and reviewed other system planning documents. We reviewed a variety of DOD's IUID implementation efforts and visited selected sites (based on a non-generalizable, judgmental sample) to observe key IUID activities; these sites represent each DOD component and were selected in part based on the type of IUID activity performed at each. For all our objectives, we interviewed officials knowledgeable about DOD's IUID implementation efforts. We assessed the reliability of data provided by DOD by reviewing existing information about the data and the systems that produced the data and by interviewing agency officials knowledgeable about the data to determine the steps taken to ensure the accuracy and completeness of the data. We have determined that the data are sufficiently reliable for the purposes of reporting the findings in this study.

We conducted this performance audit between May 2011 and May 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. More detailed information on our scope and methodology is provided in appendix I.

Background

Criteria and Process for Using IUID Technology

DOD has established criteria for the types of items that are required to be marked with IUID labels.¹⁵

¹⁴GAO, *DOD Business Transformation: Improved Management Oversight of Business System Modernization Efforts Needed*, [GAO-11-53](#) (Washington, D.C.: Oct. 7, 2010).

¹⁵DOD Instruction 8320.04, *Item Unique Identification (IUID) Standards for Tangible Personal Property* (June 16, 2008). In 2010, the Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics revised certain aspects of the criteria in a memorandum entitled *Item Unique Identification (IUID) of Tangible Personal Property—Policy Refinement for Secondary Items in Use or in Inventory* (Dec. 30, 2010).

For principal end items and contractor-marked secondary items, the criteria are as follows:¹⁶

1. all items for which the government's unit acquisition cost is \$5,000 or more;
2. items for which the government's unit acquisition cost is less than \$5,000, when identified by the requiring activity as DOD serially managed, mission-essential or controlled-inventory;¹⁷
3. when the government's unit acquisition cost is less than \$5,000 and the requiring activity determines that permanent identification is required; and
4. regardless of value, (a) any DOD serially managed subassembly, component, or part embedded within an item and (b) the parent item that contains the embedded subassembly, component, or part.

For secondary items in use or in inventory, the criteria are as follows:

1. all DOD serially managed items including, but not limited to: sensitive, critical safety, or pilferable items that have a unique item-level traceability

¹⁶These criteria vary for different categories of inventory: there are currently four criteria for marking principal end items and new secondary items, and two criteria for marking secondary items in use or in inventory. According to DOD, end items are a final combination of end products, component parts, and/or materials that are ready for their intended use, such as a ship, tank, mobile machine shop, or aircraft, while secondary items include reparable components, subsystems, and assemblies other than major end items, consumable repair parts, bulk items and materiel, subsistence, and expendable end items (E.g., clothing and other personal gear).

¹⁷According to DOD, serially managed items are tangible items used by DOD that are designated by a DOD or Military Service Item Manager to be uniquely tracked, controlled, or managed in maintenance, repair, and/or supply by means of their serial number; mission-essential items are items that are designated as mission-essential on the basis of the composite effect of that item on the overall military mission on the basis of the most-critical significant application of the item; and controlled-inventory items are those items that are designated as having characteristics that require that they be identified, accounted for, segregated, or handled in a special manner to ensure their safeguard and integrity.

requirement at any point in their life cycle; and all depot-level reparable items;¹⁸ and

2. any other item that the requiring activity decides requires unique item-level traceability at any point in their life cycle.

In order to use IUID technology, four processes must be completed. First, each item that qualifies for IUID marking—according to DOD’s criteria—is labeled. IUID labels often contain some human-readable information, printed as text on the label. The amount and type of human-readable information varies,¹⁹ but it often contains key details about the item, such as its National Stock Number,²⁰ part number, or serial number. These are categories that DOD components use to identify items in their inventories. In certain cases, items do not have labels attached to them, and instead are labeled through a process known as direct part marking, in which the human- and machine-readable information are applied directly to the item. In addition, each individual label contains information about the item, encoded in a machine-readable, two-dimensional image printed on the label. Known as a data matrix, this image contains various pieces of information encoded in a two-dimensional bar code. Figure 1 shows a data plate with an IUID data matrix in the lower right-hand corner.

¹⁸According to DOD, sensitive items are items that require a high degree of protection and control due to statutory requirements or regulations, such as narcotics and drug-abuse items; precious metals; items that are of a high value, highly technical, or a hazardous nature; and small arms, ammunition, explosives, and demolition material. Critical safety items are parts, assemblies, installations, or production systems with one or more critical or critical safety characteristics that, if missing or not conforming to the design data, quality requirements, or overhaul and maintenance documentation, would result in an unsafe condition that could cause loss or serious damage to the end item or major components, loss of control, uncommanded engine shutdown, or serious injury or death to personnel. Pilferable items are items that have a ready resale value or application to personal possession and that are, therefore, especially subject to theft. Depot-level reparable items are a reparable item of supply that is designated for repair at depot level or that is designated for repair below the depot level, but if repair cannot be accomplished at that level, shall have its unserviceable carcass either forwarded to the depot for repair or condemnation or reported to a materiel management activity for disposition.

¹⁹According to DOD, the item’s acquiring activity has the prime responsibility for determining the most effective use of human-readable and machine-readable information on an item. See DOD MIL-STD-130N, Standard Practice for the Identification Marking of U.S. Military Property (Dec. 17, 2007).

²⁰According to DOD, a National Stock Number is a 13-digit number that consists of a 4-digit code—identifying an item in the federal supply classification system—and a 9-digit national item identification number.

Figure 1: Data Plate with IUID Data Matrix



Source: GAO.

When combined, the pieces of information encoded in the data matrix make up a globally unique string of numbers referred to as the item's UII number. To ensure that all items marked with IUID labels are globally unique, DOD requires that UII numbers be formatted according to international standards for syntax format. Further, UII numbers must be entered into DOD's IUID Registry. The registry is a database intended to ensure that each UII number is unique. An item's UII number may be entered into the registry in one of two ways: the item is marked with an IUID label and the UII number associated with that label is registered, or DOD or contractors can establish a "virtual" UII number. According to DOD guidance, these virtual UII numbers are assigned to an item that has not yet been marked with an IUID label. The guidance states that a virtual UII number may be used due to economic or logistical considerations. For example, a DOD component may virtually mark one item that is embedded in another item, so that DOD does not have to remove the embedded item solely to mark the embedded item. For legacy items already in a component's inventory, marking and registration are the responsibility of the component. For items that are not yet in DOD's inventory and are being delivered to a component—or for property furnished by the government to a contractor—it is the responsibility of the contractor to mark or register items. If the UII number in a data matrix is improperly formatted, it cannot be used to properly identify the item, and the data matrix must be replaced.

Second, personnel must electronically read the label's data matrix, the two-dimensional bar code in which the item's UII number is encoded.

There are several types of tools that can be used for this process, including hand-held scanners and web-based software that can read an image of a data matrix. Because data matrices cannot be read visually, electronically reading the matrices is the only way to access the UII data they contain. Figure 2 shows an electronic scanner being used to read a data plate with an IUID data matrix.

Figure 2: Electronic Scanner Being Used to Read a Data Plate with an IUID Data Matrix



Source: GAO.

Third, UII data from a data matrix is passed to an IT system. According to DOD officials, there are a variety of IT systems that have a requirement to

use UII data,²¹ and some of these systems currently have the capability to store UII data. Examples include the Army's Property Book Unit Supply Enhanced, the Navy's Configuration Data Managers Database–Open Architecture, the Marine Corps' Joint Asset Maintenance Integrated Support System, and the Air Force's Automated Inventory Management Tool. DOD officials have explained that some of these systems operate in “pockets” within the components, and do not share UII data across the components or DOD-wide. For instance, the Air Force's Automated Inventory Management Tool contains UII data that is specific to an Air Force installation, and does not have the capability to share these data with other installations. DOD's goal is for the components to share UII data across each of their individual IT systems, and DOD-wide, between components. Within DOD, this type of data sharing is characterized as “enterprisewide.” In order to accomplish enterprisewide data sharing of UII data, the components intend to use certain IT systems referred to as Enterprise Resource Planning systems. These automated systems consist of multiple, integrated functional modules that perform a variety of business-related tasks, such as general-ledger accounting, payroll, and supply chain management. DOD officials have explained that certain Enterprise Resource Planning systems will provide the capability to share UII data enterprisewide, and in this report we are focusing on DOD efforts to integrate IUID with these systems.²² Once UII data is uploaded into an IT system, such as an Enterprise Resource Planning system, DOD intends to store UII data and share these data within and across DOD organizations. In addition, IT systems can use software to analyze these

²¹The DOD Investment Review Board has established IUID conditions on certain types of IT systems that must be satisfied before these systems can be funded.

²²DOD operates a number of Enterprise Resource Planning systems. According to DOD, its components plan to use the following Enterprise Resource Planning systems to share UII data enterprisewide: The Army plans to use its Logistics Modernization Planning System and Global Combat Support System. The Marine Corps plans to use its Global Combat Support System. The Air Force plans to use its Expeditionary Combat Support System; however, according to Air Force officials, the system is currently being reevaluated by the Air Force and the Office of the Secretary of Defense. The Navy was planning to use its Navy Enterprise Resource Planning System for Supply. However, in October 2011, senior Navy officials stated that the Navy did not have plans to integrate IUID with the system. As of April 2012, the Navy stated that it had not integrated IUID with the system, and while the latest version of the system's software had some IUID capabilities, the Navy had not upgraded to that version, assessed whether these capabilities match DOD IUID requirements, or funded such upgrades. The Defense Logistics Agency plans to use its Distribution Standard System.

data to improve logistics processes, such as property accountability and maintenance,²³ in DOD's supply chain.

Fourth, to achieve IUID technology's potential benefits in many logistics processes, DOD personnel will have to periodically repeat the previous steps, including scanning the matrix on an item's label; uploading the UII data into an IT system; and then storing, sharing, and analyzing the data as required by the specific logistics process. For example, in a property-accountability process that we observed, each time a weapon was checked in or out of an armory, personnel scanned the label's data matrix; the matrix's UII number was uploaded into an electronic property book; and software then matched the weapon's UII number with data that identified the weapon's owner. For many of the logistics processes in which IUID could be used, these steps would be repeated throughout an item's life cycle.

Key Organizations Involved in IUID Implementation

It is DOD's goal for its components to share UII data departmentwide, and the components are to use these data for unique item tracking. The Office of the Deputy Under Secretary of Defense for Logistics and Materiel Readiness—under the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics—is the focal point for implementing IUID capabilities for DOD's supply chain materiel. As of July 2011,²⁴ that office delegated the responsibility for programmatic lead of DOD-wide IUID implementation to the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration (ODASD[SCI]). According to component officials, each component has multiple organizations carrying out IUID implementation tasks, such as creating policy and defining requirements; planning and budgeting for implementation of policy; and executing requirements. In addition, according to component officials, each component has an office that

²³According to DODI 5000.64, property accountability should be enabled by IUID for identification, tracking, and management, in accordance with DOD Directive 8320.03, *Unique Identification (UID) Standards for a Net-Centric Department of Defense* (Mar. 23, 2007), which, among other things, establishes policy and criteria related to use of unique item identification in DOD's IT systems.

²⁴According to DOD officials, before the Deputy Assistant Secretary of Defense for Supply Chain Integration (DASD[SCI]) assumed the programmatic lead for DOD-wide implementation of IUID, the Office of Defense Procurement and Acquisition Policy—within the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics—coordinated IUID implementation efforts within the Office of the Secretary of Defense.

maintains the lead in IUID implementation policy. These respective offices are:

- Army—the Office of Life Cycle Logistics Policy, in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology;
- Navy—the Office of the Assistant Secretary of the Navy for Research, Development, and Acquisition;
- Marine Corps—the Office of the Director, Logistics Plans, Policies, and Strategic Mobility, in the office of the Deputy Commandant of the Marine Corps for Installations and Logistics;
- Air Force—the Directorate of Transformation, Deputy Chief of Staff for Logistics, Installations and Mission Support; and
- Defense Logistics Agency—the Office of Logistics Management Standards.

Also, to facilitate intercomponent communication and collaboration, the components have established a number of working groups and other bodies to facilitate coordination on IUID implementation.

DOD's IUID Task Force

The Joint Logistics Board determined that there were ambiguities concerning DOD's IUID policy, requirements, and proposed value across DOD, as well as wide variation in the components' implementation strategies, execution, and funding of IUID implementation. As a result, in 2009 the board chartered the task force, led by the Assistant Deputy Under Secretary of Defense for Maintenance Policy and Programs, and including representatives from the components and the Office of the Secretary of Defense. The task force had several goals, to include assessing the value of IUID within DOD's supply chain, and recommending changes to policy and guidance to adequately align IUID implementation with the task force's evaluation of IUID's value. The task force issued a report with recommendations in June 2010 that estimated financial costs of IUID implementation, as well as financial and nonfinancial benefits. Specifically, the report stated that DOD could begin to achieve net financial benefits of IUID implementation in fiscal year 2017. In addition, the task force recommended modifying some of DOD's IUID-marking criteria.²⁵ Subsequently, the Office of the Under Secretary

²⁵DOD, Logistics Item Unique Identification Task Force, *Implementation of Item Unique Identification in DOD Logistics Processes* (Washington, D.C.: June 8, 2010).

of Defense for Acquisition, Technology, and Logistics modified DOD's IUID marking criteria to implement some of the task force's recommended changes, issuing the modification in December 2010.²⁶ In addition, the task force issued a revision to its initial estimates, lowering its cost estimate. The revision was issued in March 2011.²⁷ DOD's key IUID policy issuances and implementation events from fiscal year 2003 to fiscal year 2011 are summarized in appendix II.

DOD Has Taken Some Steps toward Developing a Framework for Management of IUID Implementation, but Has Not Yet Incorporated Several Key Elements of a Comprehensive Management Approach

DOD has taken some steps to improve its approach to managing and implementing IUID technology, but has yet to incorporate some key elements of best management practices into its evolving framework for management of IUID implementation. These include internal controls and analysis of return on investment. According to GAO's previously published work, internal controls are important in helping agencies improve operational processes and implement new technological developments.²⁸ Internal controls include an organizational structure that clearly defines key areas of authority; policies that enforce management directives; goals; and performance measures.²⁹ In addition, GAO and DOD have identified best practices for analyzing a program's return on investment. The practices identified by GAO include providing estimates of all potential costs and the timing of costs.³⁰ DOD has identified best practices that include analyzing benefits, and making recommendations, based on relevant evaluation criteria.³¹ DOD has defined key areas of authority and responsibility for IUID implementation, and is updating policy to incorporate changes required by the implementation of IUID. However, DOD has not incorporated other key elements of best management practices into its evolving framework for management of IUID implementation. For example, DOD lacks such key information as

²⁶Principal Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics Memorandum, *Item Unique Identification (IUID) of Tangible Personal Property—Policy Refinement for Secondary Items in Use or In Inventory* (Dec. 30, 2010).

²⁷DOD, Logistics Item Unique Identification Task Force, *Implementation of Item Unique Identification in DOD Logistics Processes—an Update* (Washington, D.C.: Mar. 11, 2011).

²⁸[GAO/AIMD-00-21.3.1](#).

²⁹[GAO/AIMD-00-21.3.1](#).

³⁰[GAO-09-3SP](#).

³¹DOD, *Product Support Business Case Analysis Guidebook* (Apr. 2011).

quantitatively defined goals for marking legacy items; performance measures, such as reliable schedules for predicting when its Enterprise Resource Planning systems will have the capability to manage items using UII data; and a full estimate of IUID's cost and benefits. Without a management framework that includes quantitatively defined goals, performance measures, and a more complete estimate of all associated costs and benefits, DOD has faced challenges in implementing IUID technology and runs the risk of not fully realizing its potential benefits, including financial benefits by fiscal year 2017.

DOD Has Taken Several Steps That Could Improve Its Management of IUID Implementation

ODASD(SCI) and the components have taken some steps that could improve DOD's management approach for IUID implementation. According to the DASD(SCI), his office is in the process of developing a framework for managing and implementing IUID, which we reviewed. As of March 2012, this framework consisted of two elements. The first element is a set of July 2011 briefing slides titled "IUID Game Plan and Actions Underway." The slides include a summary of actions that DOD needs to take in key areas of IUID implementation such as the marking of items, the use of IUID in business processes, and modifying IT systems to incorporate IUID. These slides also indicate that ODASD(SCI) is following some best practices of a comprehensive management framework. In the slides, DOD clearly defines the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness as the DOD organization responsible for leading IUID implementation activities. As previously discussed, that office delegated the responsibility to ODASD(SCI). In addition, the slides discuss DOD policies that enforce management directives concerning IUID implementation and that are being updated to incorporate IUID. The second element of DOD's framework for managing and implementing IUID is a January 2012 timeline listing several planned implementation actions from fiscal years 2012 through 2017.

The components have also taken some steps toward improving their management of IUID implementation. The Army and Marine Corps are using some quantifiable goals—and certain IUID marking criteria—to track the progress of their legacy marking efforts. In addition, officials from some components told us that they had inspected some newly-acquired items to determine whether these items were sufficiently marked with IUID labels. For the items they reviewed, those inspections helped to detect problems in contractors' marking of items. Further, the Marine Corps and Air Force are planning to integrate IUID elements into implementation schedules for their Enterprise Resource Planning systems.

DOD Has Not Fully Incorporated Certain Internal Controls into Its Framework for Management of IUID Implementation

DOD has not fully incorporated internal controls, such as quantifiable goals or metrics to assess progress, into its framework for management of IUID implementation. An agency's establishment of internal controls is key in helping an agency meet its goals, and we have previously reported that in the absence of quantifiable targets, it is difficult for officials to assess whether goals were achieved, because comparisons cannot be made between projected performance and actual results.³² DOD has identified tens of millions of legacy items that meet its IUID marking criteria, but has not developed a full set of quantifiable goals or metrics to assess its progress in marking these items. The task force has stated that DOD will not achieve IUID's potential benefits unless DOD marks a "significant" number of these legacy items, and an ODASD(SCI) official stated that DOD needs to mark a "majority" of these legacy items by fiscal year 2015. However, the task force and ODASD(SCI) have not quantitatively defined the terms "significant" or "majority," respectively. Further, according to the task force report, the number of legacy items DOD will mark is an important factor in determining when DOD may begin to realize IUID's projected financial benefits. Therefore, without metrics to quantify its progress in marking legacy items, it is unclear whether DOD will begin to realize these benefits by fiscal year 2017, the year in which the task force report projects these benefits may begin.

Another key internal control is the use of performance measures, and we have previously reported that such metrics for a program's main efforts—including interim milestones and schedules—give decision makers the information needed to assess progress and estimate realistic completion dates.³³ In its framework for managing and implementing IUID, ODASD(SCI) has an IUID timeline that contains targets for several types of IUID implementation efforts, including requirements and business rules; legacy-item marking; and Enterprise Resource Planning system updates. In addition, the DASD(SCI) stated that he has asked components to provide his office with IUID implementation plans that contain interim milestones for the marking of legacy items. However, ODASD(SCI) and the components have not fully developed interim milestones, schedules, or metrics to assess DOD's progress in IUID implementation. For example, neither ODASD(SCI) nor the components

³²[GAO-10-835](#).

³³[GAO-11-53](#) and [GAO-08-883T](#).

have adequate schedules for the integration of IUID with their Enterprise Resource Planning systems.

We have previously reported that an important element of measuring performance is the collection of data that are complete and consistent enough to document performance and support decision making.³⁴ As previously discussed, DOD has established IUID marking criteria for different categories of inventory. We found that some components used these criteria to track their progress in marking legacy items; however, others did not. The DASD(SCI) stated that he has asked the components to periodically report on their progress in marking legacy items to his office. However, he stated that he has not asked the components to use DOD's IUID marking criteria in their reporting.

DOD Has Not Completed a Full Analysis of IUID's Return on Investment

We have previously reported that another key element of best management practices is analysis of return on investment. A complete analysis on the return on investment consists of several best practices identified in previously published GAO and DOD work. The practices identified by GAO include providing estimates on all potential costs and the timing of costs.³⁵ DOD has identified best practices for analyzing benefits, and making recommendations, on the basis of relevant evaluation criteria as a best practice.³⁶ In addition, GAO has reported that performing a sensitivity analysis of these estimates demonstrates the effects on the cost and schedule of an assumption that may no longer be valid.³⁷ DOD began implementation of IUID in fiscal year 2003, and in fiscal year 2009 the task force estimated some costs and benefits of implementation. The task force report discusses how IUID could improve DOD's logistical efficiency and effectiveness. In addition, the report provides a "rough order of magnitude" assessment of certain costs and

³⁴[GAO/GGD-96-118](#).

³⁵[GAO-09-3SP](#).

³⁶DOD, *Product Support Business Case Analysis Guidebook* (Apr. 2011).

³⁷[GAO-09-3SP](#).

DOD Has Not Fully Estimated
Costs of IUID Implementation

financial benefits of implementation;³⁸ and projects when DOD may begin to realize financial benefits. However, the components, ODASD(SCI), and the task force did not fully follow certain best practices for the estimation of costs and financial benefits. As a result, DOD does not have a full analysis of IUID's potential return on investment.

DOD's components could not provide complete historical and planned spending data for IUID implementation, and ODASD(SCI) has not tracked the components' spending or budget requests for IUID. According to GAO best practices for cost estimation, historical data on the cost of a system is important for projecting a credible estimate of future costs.³⁹ Although the Marine Corps and Air Force provided us with complete estimates of the amount of money they have spent in their IUID budgets, the Army and Navy provided incomplete estimates of their IUID spending, and the Defense Logistics Agency did not provide an estimate. These components were not able to provide complete estimates because they do not track IUID spending as a distinct budget category. In addition, ODASD(SCI) does not track the five components' historical spending on IUID.

Although the components were not able to provide complete historical spending information, according to the information they provided, the components spent at least \$219 million on IUID implementation from fiscal year 2004 through fiscal year 2011. Officials explained that they spent this money on a variety of IUID implementation efforts, including the acquisition of marking equipment, such as IUID label printers and scanners; the marking of legacy items; and the development of software to support marking processes. Table 1 summarizes the five components' reported historical spending on IUID over 8 fiscal years.

³⁸According to GAO's previously published work on cost estimation, a rough order of magnitude can be developed when a quick estimate is needed and few details are available. Because it is developed from limited data and in a short time, a rough order of magnitude analysis should never be considered a budget-quality cost estimate. See [GAO-09-3SP](#).

³⁹[GAO-09-3SP](#).

Table 1: Components' Reported Spending on IUID Implementation in Fiscal Years 2004 through 2011

Current dollars in millions

Fiscal year	Army	Navy	Marine Corps	Air Force	Defense Logistics Agency	Total
2004	0.2	Did not report	0.0	0.0	Did not report	0.2
2005	0.2	Did not report	0.0	0.0	Did not report	0.2
2006	0.8	Did not report	0.0	12.3	Did not report	13.1
2007	0.6	3.6	0.0	14.1	Did not report	18.3
2008	0.6	8.5	7.0	23.1	Did not report	39.2
2009	2.2	3.0	27.0	24.4	Did not report	56.6
2010	1.9	Did not report	23.2	33.4	Did not report	58.5
2011	2.5	Did not report	21.1	9.3	Did not report	32.9
Total	9.0	15.1	78.3	116.6	NA	219^a

Source: GAO analysis of DOD data.

^aThe components' total reported spending in fiscal year 2011 dollars is \$226.1 million.

The Army provided an estimate of the money spent on IUID implementation in its depots over this period but, as an official explained, could not provide an estimate of IUID spending outside of its depots because it does not track IUID funding as a distinct budget category. The Navy was also able to report on a portion of its IUID spending that was executed by one office within the Navy, but Navy officials stated that because the Navy has not funded IUID implementation in a centralized fashion, the Navy cannot track how much other Navy offices have spent in implementing IUID. An official from the Defense Logistics Agency explained that while the agency does spend money on IUID implementation, it does not have a distinct budget for IUID implementation, and so cannot specifically track its IUID costs.

With regard to future spending, the Marine Corps and the Air Force reported that they requested a total of \$19.2 million (Marine Corps: \$10.8 million; Air Force: \$8.4 million) for IUID implementation in fiscal year 2012. However, the Army and Navy were unable to provide their budget

requests for fiscal year 2012 because they do not budget for IUID spending as a distinct budget category. According to officials from the Defense Logistics Agency, an office within the agency submitted a request for IUID implementation spending, but this request was not included in the agency's final fiscal year 2012 budget request.

In addition to the components not fully tracking their spending on IUID implementation, ODASD(SCI) does not track the components' spending on IUID implementation. ODASD(SCI) explained that the office uses a set of "scorecards" to track the components' IUID implementation efforts. In 2011, ODASD(SCI) received two sets of scorecards, the first in January and the second in November. In our review of these scorecards, we found that the components do not report information on either the amount of money they have spent on IUID implementation, or the amount of money that they plan to request for IUID implementation.

In its report, the task force estimates that DOD would need to invest \$3.2 billion to realize the benefits of IUID implementation.⁴⁰ This estimate includes several types of costs, such as the cost of marking legacy items and the labor required to perform various implementation tasks. However, the estimate does not include the following four costs:

- The task force could not completely estimate the costs associated with how individual logistics processes would need to change to incorporate the use of IUID technology, because it did not have sufficient information about these changes. As a relatively new technology, IUID is not widely used in existing DOD logistics processes. That means that the components will have to modify existing processes to use IUID. DOD has made some progress in defining the type of logistics processes that would need to change to incorporate IUID. For example, according to ODASD(SCI), DOD intends to modify 10 different categories of logistics processes, such as receipt and distribution of items. DOD has made some progress in planning for such modifications. For example, the Army Materiel Command has determined that 11 of its logistics processes will incorporate IUID functionality through one of the Army's Enterprise

⁴⁰According to officials from the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics; the task force; and components, the estimates of the costs and benefits of IUID implementation that have been produced by the task force are the only estimates of their kind within DOD.

Resource Planning systems. However, according to Army officials, the Army has not yet defined the distinct steps at which personnel will use IUID, within its logistics processes. Further, according to DOD officials, the components have not determined the full number or type of business processes within these categories that need to be modified. In addition, in their 2011 scorecard updates, the Army, Marine Corps, and Air Force reported challenges or concerns with progress in defining how their business processes will require modification because of IUID. Without information on the number of logistics processes that will require modification and the specific steps that will need to change to accommodate the incorporation of IUID, the task force could not have completely estimated costs. Several DOD officials we spoke with agreed with this assessment, explaining that without this information, the task force was not able to completely estimate IUID implementation costs.

- The task force report states that the task force did not include the cost of modifying Enterprise Resource Planning systems to share and use UII data because the functionality to use UII data is inherent in these systems. However, if DOD is to achieve benefits from IUID, Enterprise Resource Planning systems must have the ability to share and analyze UII data, and according to DOD officials the ability to perform these two functions is not always inherent in these systems. For example, the core software package for one of the Army's Enterprise Resource Planning systems has the capability to accept UII data, but in its current version this capability is not activated. For the system to accept UII data, the capability must be activated in a future update. According to DOD officials, such modifications to Enterprise Resource Planning systems can incur costs. Navy officials explained that the task force report does not include the additional cost that would be required to modify the Navy's systems to communicate with other components' systems, or to analyze UII data to improve logistics processes. By not including certain costs to modify the relevant Enterprise Resource Planning systems, the task force may have left out a substantial set of costs.
- The report did not include the full cost of marking newly-acquired items with IUID. Because the Defense Federal Acquisition Regulation Supplement contract clauses provide that contractors are responsible for marking or registering items, contractors are likely to build the cost of marking items into their contract pricing. Therefore, while contractor personnel are marking the items in question, this cost is borne by DOD to the extent that the contractor has built the cost of marking qualifying items into the costs of the goods or services provided. According to component officials, the components do not know how much of a newly-acquired item's cost is attributable to contractors'

marking of that item. However, according to estimates in the task force report and provided by the Air Force, contractors' average cost to mark a newly-acquired item is about \$30 to \$50. On the basis of GAO analysis of information from the DOD registry on the number and rate of contractors' registration of newly-acquired items in January 2012, IUID marking by contractors could result in approximately \$27 million to \$45 million in marking costs to the components per year. This cost is not included in the task force's estimate.

- As previously discussed, an IUID label on an item may contain human-readable information, such as the item's National Stock Number. In addition, the label has a data matrix that contains information about the labeled item. For example, the matrix contains various pieces of information that make up the globally unique string of numbers referred to as the item's UII number. Contractors have delivered items to DOD that have labels with deficient data matrices. If a label has a deficient data matrix, DOD cannot use the label's data matrix to track or manage items. The task force did not include the cost to the components of fixing these deficient IUID data matrices on contractor-marked items. Although component officials were not able to estimate the financial cost of fixing these data matrices, officials explained that there is productivity loss associated with fixing them. For example, according to Army and Marine Corps officials, their verification of a deficient matrix's missing or incorrect data requires an average of 10 to 15 minutes, and sometimes requires significantly more time, when additional research into the item is needed. This investment of time, multiplied by many thousands of deficient data matrices, may result in a substantial amount of lost productivity for DOD components' personnel.

DOD May Not Have Appropriately Estimated Financial Benefits

The task force report assessed the potential benefits of IUID implementation by examining three categories of logistics processes: intensive item management, property accountability, and product life cycle management. According to the task force's analysis, DOD's implementation of IUID is unlikely to result in substantial financial benefit in the categories of intensive item management or property accountability. However, the report did discuss potential nonfinancial benefits of IUID implementation in these two categories. The report states that the use of IUID in intensive item management could enable strict accountability and control of DOD's most critical assets—such as nuclear weapon-related material—across parts of DOD's supply chain, enhancing the security and safety of such assets. Moreover, according to the report, implementing IUID into property-accountability processes on the enterprise level could enable DOD to track equipment assets throughout their life cycle. The

report explains that one benefit of tracking on the enterprise level is that DOD may be able to more quickly address equipment losses. Further, according to an official from the Office of Defense Procurement and Acquisition Policy, the use of IUID in DOD's logistics processes could lead to improved data quality that may result from automatically entering data into IT systems, as opposed to manually entering data.

While the report does not estimate substantial savings through the integration of IUID with intensive item management or property-accountability processes, the report estimates that IUID implementation could result in annual savings of \$3 billion to \$5 billion through the implementation of IUID in a collection of maintenance processes referred to as product life cycle management.⁴¹ According to our review of the report and a task force official, the key to achieving savings through product life cycle management is to track and manage individual items by a unique identifier. That approach is called serialized item management. According to DOD officials and the task force report, DOD can achieve serialized item management by using any type of unique identifier, including a traditional serial number; a UII number; or a unique identifier provided by a different type of technology, such as a radio frequency identification device or a contact memory button.

The task force estimated achieving substantial financial benefits from product life cycle management, but it used a methodology for estimating these benefits that may not be appropriate to the scale and complexity of DOD's IUID implementation efforts. The IUID task force report states that projected savings will gradually increase as implementation of IUID spreads throughout DOD and, by fiscal years 2016 to 2017, DOD may reach a break-even point at which its annual financial savings would equal its annual spending for implementation of IUID. After fiscal year 2017, the report projects that DOD may pass the break-even point, and could begin to realize the annual savings of \$3 billion to \$5 billion.

To develop its estimate of cost savings through the use of serialized item management in product life cycle management, the task force used the following methodology:

⁴¹According to the task force report, product life cycle management is a collection of processes that include reliability-centered maintenance, total-ownership cost management, and precision maintenance.

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- Reviewed case studies of five DOD maintenance programs that use serialized item management. The task force observed that by using serialized item management,⁴² the maintenance programs reduced costs by an average of 4 to 6 percent in labor and materiel costs for maintenance, and in the cost to transport items to maintenance locations.
 - Next, the task force estimated maintenance costs by adding DOD's fiscal year 2008 budget for depot- and field-level maintenance to DOD's fiscal year 2009 budget for maintenance transportation, which together total about \$83.2 billion.
 - Finally, by applying the 4 to 6 percent reduction to \$83.2 billion in annual maintenance costs, the task force estimated that an annual savings of \$3 billion to \$5 billion could result from the use of serialized item management in product life cycle management maintenance processes.

However, three aspects of this methodology call into question whether it is reasonable to assume that DOD-wide use of IUID technology in maintenance processes would lead to the savings estimated by the task force.

- The task force estimated DOD-wide savings on the basis of a limited number of case studies, and conclusions developed from these studies may not be applicable to the substantial complexity and size of the DOD-wide maintenance enterprise. According to the Office of the Deputy Assistant Secretary of Defense for Maintenance Policy and Programs, DOD's maintenance operations support a wide range of weapon systems including about 280 ships, 14,000 aircraft and helicopters, 900 strategic missiles, and 30,000 combat vehicles. Our review of the Task Force report indicates the five case studies address—in total—five individual weapon systems, whereas DOD performs maintenance on hundreds of different systems. Moreover, four of the five case studies address either Air Force or Navy programs; only one addressed Army programs. Because of the limited scope of the case studies used by the task force, conclusions based on these case studies may not apply to the DOD-wide maintenance budgets that the task force used in its estimation of savings.
- The case studies did not address programs that use IUID as the technology that provides a unique identifier to track items through

⁴²We did not validate the cost-savings estimates of the case studies reviewed by the task force.

serialized item management. Rather, the case studies addressed programs that use other means of uniquely tracking items, such as contact memory buttons. Thus, the case studies do not consider costs that may be specific to IUID technology, such as the cost to purchase scanners or software to read data matrices, or the cost to replace deficient IUID data matrices. Because of this, it may be inaccurate to assume that maintenance programs using IUID technology will achieve the same type or amount of savings claimed by the case studies of programs using other technologies.

- Even when a logistics program experiences cost savings after introducing a new technology or process, it can be difficult to link the savings directly to a specific cause or technology. For example, we visited an installation that is using a combination of IUID, passive radio frequency identification, new database software, and a reorganization of warehouse space to reduce the cost of managing its supply chain. However, an installation official explained that it was not possible to determine the extent to which the cost savings were attributable to a specific change, such as the introduction of IUID. For this reason, it may have been incorrect for the task force to assume a link between estimated cost savings and the use of a specific technology such as IUID.

The Task Force Report Did Not Include a Sensitivity Analysis

We have previously reported that every estimate is uncertain because of the assumptions that must be made about future projections, and because of this, cost estimators should always perform a sensitivity analysis that demonstrates the effects on the cost and schedule of an assumption that may no longer be valid.⁴³ The task force report estimates that DOD could begin to realize financial savings from IUID implementation after fiscal year 2017, and explains that its cost and benefit estimates are conditional, depending on a number of assumptions. However, the task force report does not contain a sensitivity analysis for either its cost or its benefit estimates. As a result, the task force's report does not portray the potential effects of changing key assumptions on the report's estimates of cost, financial benefits, or the time frames in which the report estimates DOD may realize financial benefits.

There is a substantial amount of uncertainty associated with key assumptions on which the task force report's estimates are based. For

⁴³GAO-09-3SP.

example, the task force report states that the cost to mark legacy items is one of the primary drivers of IUID implementation costs. However, as discussed in more detail later, DOD may face challenges in determining the total number of legacy items it must mark. The task force's cost estimate does not reflect the range of costs associated with marking a population of legacy items that—according to DOD estimates—may range between about 60 million and 122 million items. In addition, the task force's estimate of financial benefits assumes that the components' IT systems, including their Enterprise Resource Planning systems, will have the capability to use UII data for product life cycle management in 2015. However, as discussed later in the report, the components cannot reliably predict when their Enterprise Resource Planning systems will be able to use UII data for product life cycle management. The task force's estimate of when DOD will begin to realize these benefits does not reflect the possibility that the components' Enterprise Resource Planning systems will not have this capability in fiscal year 2015.

Also, the task force's estimates of financial benefits assume IUID implementation across each of DOD's components. However, as discussed in more detail later, the Navy, Air Force, and Defense Logistics Agency are currently not carrying out key IUID implementation efforts. For example, the Navy is not systematically marking legacy items and the potential integration of IUID with its Enterprise Resource Planning system for Supply is unfunded. In addition, the Air Force is not actively integrating IUID into its Enterprise Resource Planning system. Also, the Defense Logistics Agency is not marking legacy items. The task force's estimate of financial benefits does not consider that some benefits may not be achieved as a result of DOD's partial implementation of IUID. Without a sensitivity analysis of its cost and benefit estimates, the task force report does not provide DOD leaders with information about how well the estimates may hold up under reasonable changes to the assumptions on which the estimates are based.

DOD and Contractors Have Made Some Progress Marking Items with IUID, but DOD Faces Challenges in Assessing Progress toward Goals and Ensuring That Items Are Sufficiently Marked

DOD components and contractors have been marking items with IUID, but due to several challenges, it is difficult for DOD to assess its progress in marking items or ensuring that contractors are sufficiently marking items. DOD components have reported marking more than 2 million legacy items,⁴⁴ and DOD has identified tens of millions of legacy items that meet its IUID marking criteria. But, DOD does not have complete information on the total number of legacy items that its components have marked and must mark in the future. Moreover, DOD has not developed a full set of quantifiable goals to assess its progress in marking these items. Further, DOD has not set interim milestones to determine the components' progress in marking items, and DOD's components do not use consistent criteria to track progress in legacy item marking. With respect to newly-acquired items and pieces of government-furnished property, DOD reports that as of January 2012, more than 2,500 contractors had delivered newly-acquired items to DOD and had registered over 11.5 million such items and pieces of government-furnished property in DOD's IUID Registry. However, DOD cannot ensure that contractors are sufficiently marking all of the items that require IUID labels, for two reasons: DOD reporting requirements do not provide assurance that appropriate marking clauses are included in all contracts, and DOD components do not have systematic processes to assess the sufficiency of IUID data matrices. As a result, DOD may be unable to ensure that contractors are marking all newly-acquired items and pieces of government-furnished property that require IUID labels, and DOD cannot know the extent to which contractors are supplying IUID data matrices that the components need to track items with IUID technology.

⁴⁴As previously discussed, we have separated qualifying items into two categories: legacy items and contractor-marked items. Items are marked with IUID labels either by DOD components or by contractors. If an item qualifies for IUID marking, the DOD components are responsible for marking the item if it is currently in their inventory (legacy items), while contractors are responsible for marking the item if they are delivering it to DOD, or are using property furnished to them by the government (contractor-marked items). Contractors either mark items that DOD is purchasing (newly-acquired items), or items that DOD has provided to contractors (government-furnished property).

DOD Components Have Made Some Progress in Marking Legacy Items, but Several Challenges Make Progress toward Marking Goals Difficult to Assess

DOD has made some progress in marking legacy items. In late 2004, the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics established the requirement for DOD components to mark legacy items with IUID labels and for the military services to develop plans to accomplish such marking. An Army depot began marking legacy items in 2005, and according to information from DOD's IUID Registry, DOD components began registering legacy items in 2006. As of October 2011, the components reported marking more than 2 million legacy items. However, DOD does not have complete information on the total number of items to be marked and that have been marked; DOD has not quantifiably defined its marking goals according to DOD's IUID marking criteria; DOD has not set interim milestones to determine the components' progress in marking items; and DOD's components do not use consistent criteria to track progress in legacy item marking.

Total Number of Items to Be Marked and That Have Been Marked Is Uncertain

The components provided us with estimates of the total number of items that must be marked in the future, according to DOD's IUID marking criteria. According to the components, the total number of items in their inventories that meet DOD's IUID marking criteria is about 122 million. In addition, the components provided us with estimates of the total number of legacy items they have marked, if estimates were available. As of October 2011,⁴⁵ the Army, Marine Corps, and Air Force reported that they had marked a total of about 2.7 million legacy items. The Navy and Defense Logistics Agency did not report the marking of legacy items.

- The Army reported that its inventory contains about 15 million items that meet DOD's IUID marking criteria, and that it had marked about 1.2 million legacy items.
- The Marine Corps reported that its inventory contains about 3.1 million items that meet DOD's IUID marking criteria, and that it had marked about 0.3 million legacy items.

⁴⁵Each of the five DOD components provided data in October 2011. To generate its October 2011 data, the Marine Corps used a method that was not consistent with the method used by the Army and Air Force to generate their data. To make its data consistent with the other two components, the Marine Corps adjusted its method, and in January 2012 provided us with data that are consistent with the data provided by the Army and Air Force. The Air Force reported additional information in November 2011. We included this additional information in the Air Force's estimate of the total number of legacy items in its inventory that meet DOD's IUID marking criteria.

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- The Air Force reported that its inventory contains about 13.3 million items that meet DOD’s IUID marking criteria, and that it had marked about 1.2 million legacy items.
 - The Navy reported that its inventory contains about 60.6 million items that meet DOD’s IUID marking criteria. However, the Navy could not provide an estimate of the number of legacy items it had marked. According to a Navy official, there are “pockets of compliance” within the Navy, in which certain organizations had marked legacy items with IUID labels. But the Navy does not have a Navy-wide, systematic plan or approach to legacy marking; it does not track the number of legacy items being marked within these pockets; and it characterized its progress in legacy marking as “minimal.”
 - The Defense Logistics Agency reported that its inventory contains about 30.0 million items that meet DOD’s IUID marking criteria. However, according to the agency, it is not currently marking legacy items; does not have the capability or required technical information to mark the legacy items in its inventory; and does not plan to mark legacy items in the future. For example, the agency does not have marking equipment. In addition, agency officials explained that the agency lacks information on how to appropriately mark legacy items with IUID labels.⁴⁶ According to the officials, the other components must provide this information to the agency, because the components manage the items that the agency stores in its inventory.

With regard to the total number of items to be marked in the future, some component officials stated that their estimates are incomplete. For example, Army officials explained that their estimate does not include certain classified items because the system they used to estimate the Army’s legacy item inventory does not interface with systems that track those classified items. Navy officials stated that their estimate does not include items that are embedded in other items—such as a circuit board inside of an aircraft—because of system limitations and the time it would have taken to include these items in the Navy’s estimate. Further, Defense Logistics Agency officials explained that their estimate does not include items that are classified by the components as serially managed. Moreover, the components’ estimates of legacy items to be marked in the future do not match the estimate of the total number of legacy items to be marked according to the task force’s report. According to the report, DOD

⁴⁶The components carry out the engineering support activity that determines where the label should be placed on the item. Where the IUID mark is placed on the item influences the mark’s durability and usefulness.

has a total of about 60 million legacy items to be marked. However, the components report that they must mark a total of about 122 million legacy items, and the Navy alone estimates it has 60.6 million legacy items to mark in the future. Because the task force's estimate is 49 percent smaller than the components' estimates, DOD may not have complete information on the total number of legacy items in its inventory that meet IUID marking criteria, and that it must mark in the future.

As stated above, the components reported to us that they had marked about 2.7 million legacy items. However, information from the DOD IUID Registry indicates that about 4.9 million legacy items were registered as of October 2011.⁴⁷ As previously discussed, an item's UII may be entered into the registry in one of two ways. First, the item can be marked with an IUID label, and the UII associated with that label is registered. Second, DOD or contractors can establish a virtual UII, registering an item before it is eventually marked with a label. Because the registry's estimate of legacy items registered is 45 percent larger than the components' estimate, it is unclear how many legacy items that DOD has marked. Table 2 summarizes the components' estimates of the total number of legacy items in their inventories that meet DOD's IUID marking criteria; the task force's estimate of the total number of legacy items in the components' inventories that meet DOD's IUID marking criteria; the components' estimates of the total number of legacy items they have marked; and the total number of legacy items recorded in the DOD IUID Registry.

⁴⁷The DOD IUID Registry contains information on legacy items marked by DOD organizations other than the five components addressed in this report. However, according to an official from the Office of Defense Procurement and Acquisition Policy, the five DOD components addressed in this report are conducting the vast majority of legacy item marking, and thus it is valid to assume that only a very small fraction of the legacy items recorded in the registry were recorded by DOD organizations other than these five components.

Table 2: Number of Legacy Items in Components' Inventories That Meet DOD's IUID Marking Criteria and That the Components Have Marked, as Of October 2011

Items in millions				
DOD component	Components' estimates of number of legacy items that meet DOD's IUID marking criteria ^a	Task force estimate of number of legacy items that meet DOD's IUID marking criteria ^b	Components' estimates of number of legacy items marked	DOD registry information on number of legacy items registered ^c
Army	15.0		1.2	
Navy	60.6		Did not provide	
Marine Corps	3.1		0.3	
Air Force	13.3		1.2	
Defense Logistics Agency	30.0		0.0	
Total	122.0	60.0	2.7	4.9^d
Size difference between totals		62.0		2.2
Percent difference between totals		51.0		45.0

Source: GAO analysis of DOD data.

^aThe Navy estimate was completed in December 2009. According to Navy officials, the Navy developed its estimate on the basis of the task force's recommended revisions of DOD's IUID marking criteria, which were adopted by DOD in December 2010. The Army, Air Force, and Defense Logistics Agency estimates are as of October 2011; the Marine Corps' estimate is as of January 2012.

^bThe task force first reported its estimate in June 2010 and reported the same estimate in March 2011.

^cThe DOD IUID Registry contains information on legacy items marked by DOD organizations other than the five components addressed in this report. However, according to an official from the Office of Defense Procurement and Acquisition Policy, the five DOD components addressed in this report are conducting the vast majority of legacy item marking, and thus it is valid to assume that only a very small fraction of the legacy items recorded in the registry were recorded by DOD organizations other than these five components.

^dAccording to ODASD(SCI), the DOD IUID Registry contained 1.6 million virtual UIIs as of October 2011. Officials stated that these virtual UIIs may account for a portion of the difference between the components' reported total of 2.7 million items marked and the DOD IUID Registry's total of 4.9 million items registered.

Not All of the Goals
Established by DOD for
Measuring Progress in Marking
Legacy Items Are Quantifiable

An agency's establishment of goals is a key internal control, and we have previously reported that in the absence of quantifiable targets, it is difficult for officials to assess whether goals were achieved, because comparisons cannot be made between projected performance and actual results.⁴⁸ In 2010, the task force recommended that DOD focus its legacy marking efforts on those items from which DOD could derive the greatest benefit. According to an ODASD(SCI) official, it is DOD's goal to complete the marking of the "majority" of these legacy items by the end of fiscal year 2015. In addition, according to the task force's report, DOD's marking of a "significant" number of legacy items is one of the keys to realizing the potential financial benefits of IUID implementation. We have previously reported that, where appropriate, to more easily assess agency progress, performance goals should have quantifiable, numerical targets.⁴⁹ However, neither ODASD(SCI) nor the task force has quantified DOD's goals of marking a "majority" of legacy items, or a "significant" number of legacy items, respectively. Further, while some DOD components have quantifiable goals for marking certain legacy items, others do not. As previously discussed, DOD has established IUID marking criteria for different categories of inventory, such as certain items with a unit acquisition cost of \$5,000 or greater; certain items that are serially managed; certain items that are controlled (sensitive or classified); and certain depot-level reparable items. We found that some components had set quantifiable goals using these criteria. For instance, the Marine Corps has quantifiable goals for each of the categories defined by DOD's IUID marking criteria. The Army has quantifiable goals for each of these categories except for items that are controlled (sensitive or classified). Neither the Navy nor the Air Force have established quantifiable goals defined by DOD's IUID marking criteria.

DOD Has Not Established a
Full Set of Quantifiable Interim
Milestones for Measuring
Progress in Marking Legacy
Items

Once quantifiable goals have been established, we have previously reported that metrics for a program's main efforts—such as interim milestones and schedules—give decision makers the information needed to assess progress and estimate realistic completion dates.⁵⁰ As previously discussed, we have noted that quantifiable target—such as interim milestones—can assist organizations in tracking progress toward

⁴⁸ [GAO/AIMD-00-21.3.1](#) and [GAO-10-835](#).

⁴⁹ [GAO-03-143](#).

⁵⁰ [GAO-08-883T](#).

their goals. For example, quantifiable interim milestones could assist DOD in evaluating whether the components are marking legacy items at a rate that will allow DOD to meet its fiscal year 2015 goal of marking a “majority” or “significant” number of legacy items in its inventory.

As of January 2012, ODASD(SCI), the task force, and the components had not fully developed quantifiable interim milestones to track progress toward DOD’s goals for marking legacy items. Neither ODASD(SCI) nor the task force had set interim milestones for the number of items that should be marked in fiscal year 2015, DOD’s target date for marking a “majority” of legacy items and a “significant” number of legacy items. Further, while some components have set interim milestones for tracking their progress in marking certain legacy items, others have not. For instance, the Air Force has established interim milestones for the marking of some legacy items, such as class VII equipment,⁵¹ but it is still working on developing interim milestones for others, such as class II items. The Marine Corps has established a goal of completing the marking of about 34 percent of its legacy items by December 2012. However, it has established no interim milestones. Similarly, neither the Navy nor the Defense Logistics Agency has developed interim milestones.

In January 2012, ODASD(SCI) provided us with an IUID timeline containing targets that are not quantified. The IUID timeline indicates that ODASD(SCI) expects the components to be marking legacy items at least through fiscal year 2017. In addition, ODASD(SCI)’s IUID timeline lays out fiscal year 2012 targets for the components to determine the number of items they need to mark, and fiscal year 2013 targets for the components to report on their legacy marking progress to ODASD(SCI). According to ODASD(SCI) officials, the office intends for the components to use the Federal Logistics Information System to eventually provide

⁵¹DOD organizes its materiel using a number of different categories. One such category is classes of supply, in which DOD has defined 10 classes. Among these are class VII, which contains items such as aircraft engines; and class II, which contains items such as electronics and weapons.

DOD Components Use
Inconsistent Criteria for
Tracking Progress

quantifiable reports on their legacy marking efforts.⁵² In addition, the DASD(SCI) stated that he has asked the components to develop quantifiable interim milestones for legacy marking. The components' use of the system may provide them with a means to report progress in regard to these milestones. However, ODASD(SCI) officials stated that the system does not yet have this capability and they do not yet have an estimate for when the components could begin their reporting. Until ODASD(SCI) and the components begin to use such milestones to assess DOD's progress in marking legacy items, it is difficult to know whether DOD's current number of marked legacy items represents what DOD intended to achieve, almost 7 years after DOD established the requirement to mark legacy items.

We have previously reported that an important element of measuring performance is the collection of data that are complete and consistent enough to document performance and support decision making.⁵³ However, we found that the various DOD components track their progress in the marking of legacy items by using different criteria. As previously discussed, DOD has established IUID marking criteria for different categories of inventory. We found that some components used these criteria to track their progress, while others did not. For instance, the Army and the Marine Corps currently use DOD's IUID marking criteria to track their progress in marking legacy items. The Air Force defines its progress in marking legacy items according to military classes of supply, which is not one of the categories of inventory in DOD's IUID marking criteria. ODASD(SCI)'s January 2012 IUID timeline does not indicate whether either ODASD(SCI) or the components intend to track and report legacy marking progress using consistent criteria. Without the components reporting complete and comparable data, DOD's assessment of its progress in marking legacy items will remain limited. ODASD(SCI) and the components' use of numerical goals, interim

⁵²According to DOD, the Federal Logistic Information System is the primary computer system through which users are able to access, maintain, store, and retrieve necessary information related to items of supply in the Federal Catalog Program, which provides a uniform system of item identification; precludes/eliminates different identifications of like items; reveals interchangeability among items; aids in parts standardization; facilitates intra- and interdepartmental logistics support; and improves materiel management and military effectiveness by promoting efficiency and economy in logistics operations.

⁵³[GAO/GGD-96-118](#).

milestones, and the tracking of progress with categories defined by DOD's IUID marking criteria is summarized in table 3.

Table 3: DOD's Methods of Assessing Progress in Legacy Item Marking Using Categories Defined by Its IUID Marking Criteria, as of October 2011

Organization	Is organization using categories defined by DOD's IUID marking criteria ^a		
	Numerical goals	Interim milestones	Tracking progress
ODASD(SCI)	No	No	No
Army	Yes, for 4 categories	No	4 categories of DOD's IUID marking criteria
Navy	No	No	No
Marine Corps	Yes, for 5 categories	No	All categories of DOD's IUID marking criteria
Air Force	No	No	Military class of supply, which is not a category of DOD's IUID marking criteria
Defense Logistics Agency	Yes, for 4 categories	No	No

Source: GAO analysis of DOD data.

^aAs previously discussed, DOD has established criteria for the types of items required to be marked with IUID labels. These criteria vary for different categories of inventory: there are currently four criteria for marking principal end items and new secondary items, and two criteria for marking secondary items in use or in inventory. The criteria include certain items for which the government's unit acquisition cost is \$5,000 or more, as well as certain types of items that cost less than \$5,000, to include those that are serially managed; certain items that are depot-level repairable; and those deemed by a DOD component to require unique item-level traceability at any point in their life cycle.

DOD Has Taken Some Steps to Ensure That Contractors Are Sufficiently Marking Newly-acquired Items and Government-Furnished Property Requiring IUID, but Faces Challenges

While legacy items are marked by DOD, newly-acquired items and government-furnished property must be marked by DOD's contractors. DOD has made some progress in ensuring that these types of items are marked by contractors. According to the DOD IUID Registry, more than 2,500 contractors had registered over 11.5 million newly-acquired items in the registry as of January 2012. DOD plans to eventually finish marking its legacy items, but contractors will continue to mark items that are acquired by DOD, or provided by DOD to contractors, and meet its IUID marking criteria.⁵⁴ According to January 2012 data from the DOD IUID Registry, the number of newly-acquired items and government-furnished property already exceeds the number of legacy items. If current marking trends continue, the ratio of these items to legacy items will continue to increase, and newly-acquired items and government-furnished property will continue to make up the majority of DOD's inventory of IUID-labeled items. For this reason, the future success of DOD's IUID implementation efforts depends on having contractors sufficiently mark newly-acquired items and government-furnished property with IUID labels. While DOD has made some progress, it cannot currently ensure that contractors are sufficiently marking all of the items that require IUID labels, for two reasons: reporting requirements do not provide assurance that appropriate IUID-marking contract clauses are included, and DOD's inspection efforts are not systematic. Without adequate reporting requirements regarding the components' insertion of IUID clauses into applicable contracts, DOD cannot know the extent to which it is requiring contractors to mark all items that should have IUID labels. And, without sufficient inspection of IUID data matrices, DOD cannot know the extent to which contractors are supplying deficient data matrices.

Process for Marking, and Verifying the Marking, of Qualified Items

In order for DOD to use IUID technology to track contractor-marked items that qualify for IUID marking, DOD and its contractors must take certain steps to help ensure that qualified items are marked, and that the IUID marks are usable. These steps are as follows:

⁵⁴There is no set number of newly-acquired items or pieces of government-furnished property required to be marked with IUID labels. The number of such items marked depends on the number of items acquired by DOD or provided to contractors in a given year that meet DOD's IUID marking criteria. Whatever the number of such items, DOD policy holds that all these items meeting the DOD IUID marking criteria should be marked with IUID labels by contractors.

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- in contracts for qualified items, the components must ensure that the contracts contain appropriate contract clauses and that those clauses are correctly completed. These clauses require the contractor to mark or register qualified items;
 - the contractor must then mark items with an IUID label with a data matrix that can be read electronically or establish a virtual UII in some cases; and
 - the data matrix must contain the necessary information, organized with the proper data elements and syntax, which must be registered in DOD's IUID Registry.⁵⁵

DOD components have processes in place to ensure the sufficiency of data matrices in IUID labels the components use to mark legacy items. Upon labeling an item, the component personnel electronically read the label's data matrix. If the matrix is not usable, personnel replace it with a new label that has a functioning matrix. To ensure that contractors are sufficiently marking newly-acquired items and government-furnished property with IUID labels, DOD has taken two key steps. The Defense Federal Acquisition Regulation Supplement requires DOD components to insert specific clauses into contracts that involve newly-acquired items and government-furnished property that meet DOD's IUID marking criteria. One clause requires contractors to mark and register specified types of items that DOD is acquiring from the contractor (the acquired-items clause),⁵⁶ and the other clause requires contractors to establish a unique identifier for—and register—specified pieces of government-furnished property (the government-property clause).⁵⁷ These clauses require contractors to mark with IUID labels or register all items meeting specified criteria, or otherwise listed in the contract clause; and to format the labels' data matrices according to DOD-wide standards. In addition, according to DOD officials, it is a good practice for the components or the Defense Contract Management Agency to inspect items acquired from contractors to determine whether qualified items are marked with an IUID

⁵⁵In this report, we use the term “sufficiently” to describe marking efforts that correspond to these steps, and “deficient” to describe data matrices that are not usable because they lack necessary attributes identified in these steps. For example, a data matrix that cannot be read electronically is considered deficient.

⁵⁶Defense Federal Acquisition Regulation Supplement section 252.211-7003.

⁵⁷Defense Federal Acquisition Regulation Supplement section 252.211-7007. The clause requires contractors to either mark the item with a DOD-recognized UII or establish a virtual identifier for the item in the DOD IUID Registry.

Reporting Requirements Do Not Provide Assurance That Appropriate Contract Clauses Are Included

label and whether that label's data matrix is formatted according to DOD-wide standards. Officials from several components told us that they had inspected some newly-acquired items to determine whether these items were sufficiently marked with IUID labels. For the items they reviewed, those inspections helped to detect problems in contractors' marking of items. Also, since 2009, the Defense Contract Management Agency has had a surveillance program in place to inspect newly-acquired items and assess contractors' compliance with the acquired-items clause.

A DOD memorandum requires that the components report to the Office of Defense Procurement and Acquisition Policy on only a portion of contracts that should include the clauses related to IUID.⁵⁸ According to the memorandum, components are required to report on, among other things, whether the acquired-items clause is present in contracts for newly-acquired items. However, they are not required to report on whether the government-furnished property clause is present in contracts involving government-furnished property. Several components are thus reporting only on whether they are including the acquired-items clause in contracts. While the Air Force reports on whether it is including both the acquired-items clause and the government-property clause in contracts, the Army, Navy, Marine Corps, and Defense Logistics Agency report only on whether they are including the acquired-items clause. While certain components are reviewing contracts for items that cost more than \$5,000 or are serially managed, none of the components are reviewing contracts for items that meet other DOD IUID marking criteria, such as those for controlled (sensitive or classified) items. Consequently, DOD does not know the full extent to which the components are complying with the requirements to include IUID-related clauses in contracts. Without this information, DOD may be unable to ensure that contractors are marking all newly-acquired items and pieces of government-furnished property that require IUID labels.

DOD's Inspection Efforts Are Not Systematic

According to DOD officials, it is a good practice for either a DOD component or the Defense Contract Management Agency to inspect items to ensure that contractors have marked items with IUID labels, and that the labels' data matrices are not deficient. Inspection of newly-acquired items is important because contractors have been delivering

⁵⁸Director of Defense Procurement and Acquisition Policy Memorandum, *IUID DFARS Rule Compliance Reporting* (Dec. 4, 2007).

IUID labels with deficient data matrices that cannot be used by DOD. However, neither the components nor the Defense Contract Management Agency have been systematically inspecting the data matrices in IUID labels applied to items by contractors. According to both the Marine Corps and the Air Force, more than 10 percent of the newly-acquired items' data matrices they examined after receipt of the items from the contractor have been deficient. For example, one Marine Corps installation reported that from January 2010 through October 2011, there were 8 months in which more than 10 percent of newly-acquired items provided by contractors were marked with deficient data matrices. Problems include having matrices in which the syntax of the UII data was incorrect or missing key elements; matrices that could not be electronically read; and matrices that contained a UII number that had not been registered in DOD's IUID Registry.

Although the Marine Corps and Air Force have assessed a portion of the data matrices on newly-acquired items in their inventories, these components are not systematically assessing whether contractors are sufficiently marking these items. For example, the Marine Corps estimates that it has assessed the sufficiency of contractors' marking for about 79 percent of all newly-acquired items' data matrices in its inventory. Officials from both the Marine Corps and Air Force explained, however, that neither has developed a systematic approach for inspecting these items' data matrices. According to Army officials, the Army also lacks a systematic approach to inspecting these items' data matrices. For example, the two depots identified by the Army as furthest along in IUID implementation have not established a policy or set procedures for assessing the sufficiency of the data matrices of newly-acquired items in their inventories. Defense Logistics Agency officials explained that although its personnel do perform various types of inspection and acceptance procedures on items delivered to its sites, personnel are not inspecting items' data matrices. In addition, the Navy does not have a policy or plans in place to systematically assess newly-acquired items' data matrices.

According to the Defense Contract Management Agency's information memorandum that describes procedures for inspecting contractors' data matrices, the agency's inspectors are to verify the readability of these matrices if a scanner for reading matrices is available at the inspection site. However, as previously discussed, the only way to assess the functionality of a data matrix is to use a tool that can electronically read the matrix. Because its memorandum does not require inspectors to electronically read data matrices in all cases, the Defense Contract

Management Agency cannot ensure that the items it inspects have an IUID label with a data matrix that can be properly read; that the data matrix contains the necessary UII data, organized with the proper syntax; and that the item's UII number is registered in DOD's IUID Registry. Furthermore, officials from the Defense Contract Management Agency said their inspectors rely on contractors to provide the technology to electronically read data matrices. If contractors do not provide this technology, inspectors at those manufacturing sites cannot electronically read and verify the sufficiency of data matrices.

The Office of Defense Procurement and Acquisition Policy and the components have taken steps to address some of these challenges. For example, in February 2011, the office issued a DOD standard operating procedure for assessing the sufficiency of data matrices.⁵⁹ Also, through the Product Quality Deficiency Report process,⁶⁰ Marine Corps item managers are beginning to work with contractors to address the contractors' delivery of deficient data matrices. In addition, in the first quarter of fiscal year 2012, the Air Force began to track the number of deficient data matrices it is discovering as it assesses the sufficiency of newly-acquired items' data matrices. However, unless all of the components and the Defense Contract Management Agency are systematically assessing whether contractors are sufficiently marking newly-acquired items, DOD cannot know the full extent to which contractors are supplying deficient data matrices.

⁵⁹Office of the Director, Defense Procurement and Acquisition Policy, DOD Standard Operating Procedure, *Acquisition/Procurement Guide for Unique Item Traceability Data Integrity* (Washington, D.C.: Feb. 25, 2011).

⁶⁰A product quality deficiency is a defective or nonconforming condition that limits or prohibits the item from fulfilling its intended purpose. These include deficiencies in design, specification, materiel, manufacturing, and workmanship. A noncompliant UII mark would be reportable. A "Product Quality Deficiency Report" enables the component to report contractor noncompliance. The purpose of reporting noncompliance is to determine the cause of supply discrepancies and product quality deficiencies, effect corrective action, prevent recurrence, and provide a measure for contractor past performance. Discrepancies in packaging and deficiencies in marking and registration should be reported.

DOD Has Made Some Progress in Preparing to Share UII Data Enterprisewide, but Faces Challenges

DOD has made some progress in developing a capability to share UII data enterprisewide and integrating IUID functionality with its Enterprise Resource Planning systems.⁶¹ For example, DOD is in the process of revising key guidance on using IUID technology and UII data across DOD, and three components are temporarily storing UII data until they are ready to use these data in their Enterprise Resource Planning systems. However, DOD faces several challenges in sharing UII data enterprisewide, and it is unlikely that it will meet a fiscal year 2015 goal to use UII data for the management of items in enterprise information systems. Further, DOD cannot reliably predict when it will meet this goal, because ODASD(SCI) and the components have not fully scheduled for integrating IUID functionality with the IT systems through which the components plan to achieve this capability, their Enterprise Resource Planning systems.

To Achieve Key Benefits, DOD Plans to Use IUID Technology in Enterprisewide Logistics Processes by the End of Fiscal Year 2015

It is DOD's goal for its components to share UII data departmentwide, and the components are to use these data for unique item tracking. According to a DOD instruction,⁶² the Director for Defense Procurement and Acquisition Policy is to ensure unique IUID identifiers are established to enable items to be tracked and traced throughout their life cycle in acquisition and logistics business processes and systems, in an integrated approach across DOD. Further, a 2011 IUID implementation schedule from ODASD(SCI) states that certain DOD item management processes are to be using UII data to manage items by the end of fiscal year 2015. Specifically, according to the schedule, by fiscal year 2015, two categories of logistics processes—intensive item management and product life cycle management—are to use IUID technology.

⁶¹As previously discussed, there are a variety of IT systems that have a requirement to use UII data, and some of these systems currently have the capability to store UII data. DOD officials explained that some of these systems operate in "pockets" within the components, and do not share UII data across the components or DOD-wide. DOD's goal is for the components to share UII data across many of their individual IT systems, and DOD-wide, between components. In order to accomplish enterprisewide data sharing of UII data, DOD officials stated that the components intended to use certain IT systems referred to as Enterprise Resource Planning systems. According to officials, certain Enterprise Resource Planning systems will provide the capability to share UII data enterprisewide, and in this report, we are focusing on DOD efforts to integrate IUID with these systems.

⁶²DODI 8320.04 (June 16, 2008).

As previously discussed, the task force report assessed the potential benefits of using IUID technology in these logistics processes. In both cases, the report explains that sharing UII data across DOD is key to realizing the full benefits of these processes. Regarding intensive item management, the report states it is clear that DOD requires an enterprisewide approach to managing critical items and the largest benefits of managing items intensively would be achieved by using UII data across the enterprise.

With regard to product life cycle management, the task force report estimates that DOD could achieve substantial financial benefits through the use of UII data in this process. In our previous discussion, we explained that the task force report's methodology for estimating these financial benefits may not be appropriate. However, if DOD is to achieve potential benefits of product life cycle management, the report explains that benefits would come primarily through analysis of UII data, and that DOD should expect to see the full benefit of this analysis as its Enterprise Resource Planning systems begin sharing and using these data. As previously mentioned, the report states that DOD could begin to achieve the net financial benefits of IUID implementation in fiscal year 2017. However, in order to do so, the report assumes that DOD will have the capability to share and use UII data, enterprisewide, by fiscal year 2015.

DOD and Its Components Have Made Some Progress in Integrating IUID with Their Enterprise Resource Planning Systems

Since DOD began its IUID technology implementation efforts in fiscal year 2004, it has made some progress in preparing to share UII data enterprisewide through its Enterprise Resource Planning systems, in two main areas. First, DOD is in the process of modifying its supply chain management policy and guidance to incorporate use of IUID technology and UII data across DOD. Second, three of the components have developed IT systems to temporarily store data from IUID-labeled items until these data can be uploaded into Enterprise Resource Planning systems.

Revisions to Policy and Guidance Are Underway

In January 2012, ODASD(SCI) provided us with sections from a draft revision to the regulation that establishes DOD's supply chain management processes and procedures, including sections pertaining to

IUID.⁶³ The draft sections we reviewed define standards and procedures for using IUID in DOD Enterprise Resource Planning systems. If implemented, the revisions would likely help DOD move forward in its integration of IUID technology and UII data with its IT systems—including its Enterprise Resource Planning systems—in two ways. First, the draft revisions would establish standards for acceptable electronic scanners, which should help ensure interoperability across DOD organizations that are scanning and uploading UII data from IUID labels' data matrices. Second, the draft revisions would require DOD organizations to update their UII data-sharing capabilities by adopting a system to share UII data, such as the Defense Logistics Management Standards; according to DOD officials, this system is replacing an older one that is unable to share UII data.⁶⁴ Adoption of the Defense Logistics Management Standards is for that reason essential to IUID implementation.

UII Data Are Being Temporarily Stored

Because their Enterprise Resource Planning systems are not currently capable of accepting or storing UII data at a componentwide level, the Army, Marine Corps, and Air Force have developed IT systems to temporarily store UII data generated by the labeling of both legacy and newly-acquired items.⁶⁵ However, these systems have limited capabilities to manage or use UII data. For example, these temporary systems are not capable of sharing UII data within or between components. As of January 2012, the Air Force's temporary system was limited to use on individual computer workstations, and could not send or receive UII data from other Air Force or DOD computers. In addition, the Marine Corps used its temporary system to provide us with information on its inventory of IUID-labeled legacy items, but the system was not designed to perform more complex tasks such as analyzing UII data in support of product life cycle management processes.

⁶³This draft guidance would update DOD 4140.1-R, *Supply Chain Materiel Management Regulation*, (May 23, 2003). As of January 2012, DOD had not issued the revised version of DOD 4140.1-R, but ODASD(SCI) officials stated that they expect DOD will release the new version in fiscal year 2012.

⁶⁴According to DOD officials, the Defense Logistics Management Standards are a set of data-exchange protocols through which DOD organizations share logistics data. The system's predecessor—the Military Logistics System—is unable to transmit UII data. DOD organizations are in the process of transitioning from the older Military Logistics System to the newer Defense Logistics Management Standards.

⁶⁵These are the Army's IUID Data Warehouse; the Marine Corps' Temporary Data Storage; and the Air Force's Automated Inventory Management Tool.

DOD Faces Several Challenges in Integrating IUID and Is Unlikely to Meet Its Fiscal Year 2015 Goal

DOD faces three challenges in sharing UII data enterprisewide and integrating IUID functionality with its Enterprise Resource Planning systems. First, ODASD(SCI) and the components have not fully defined the requirements for using UII data across DOD, or within the components' Enterprise Resource Planning systems. Second, as of April 2012, the Air Force and the Navy were not actively integrating IUID with their Enterprise Resource Planning systems. And third, ODASD(SCI) and the components have not fully scheduled for integration of IUID functionality with their Enterprise Resource Planning systems. As a result, DOD is unlikely to meet its fiscal year 2015 goal to use UII data in intensive item management and product life cycle management.

Requirements Are Not Fully Defined

Officials from the Army, Marine Corps, Air Force, and Defense Logistics Agency said that their components had not yet fully defined the component-specific UII requirements for their respective Enterprise Resource Planning systems. A Marine Corps official stated that, as of January 2012, requirements for how the Marine Corps system will interface with scanners were in draft form. Officials from the Defense Logistics Agency explained that because the agency manages items on the basis of the requirements of the other components, it could not finalize the business rules for using UII data in its system until the other components had determined their requirements. According to DOD officials, it is unclear when the requirements or related business rules will be fully defined and, until they are defined, the components cannot complete their integration of IUID technology with their IT systems, including their Enterprise Resource Planning systems.

Air Force and Navy Were Not Actively Integrating IUID with Enterprise Resource Planning Systems

As of April 2012, the Air Force and the Navy were not actively integrating IUID with their Enterprise Resource Planning systems. According to Air Force officials, because of cost overruns and delays in the development of its Enterprise Resource Planning system, the Office of the Secretary of Defense and the Air Force are planning to evaluate alternatives to the system. Because this system is central to the Air Force's IUID implementation efforts and the Air Force does not know when a decision will be made, officials stated that they cannot estimate when—or whether—the system will be ready to share and use UII data. According to Air Force officials, the Air Force has a data network that provides the capability to share UII data within the Air Force, between certain IT systems. However, they stated that this data network does not currently have the capability to share UII data with other components, across DOD. Further, the officials stated that the Air Force's plan is to eventually share UII data enterprisewide through its Enterprise Resource Planning system. In October 2011, senior Navy officials stated that the Navy had no plans

ODASD(SCI) and the Components Do Not Have Complete Integrated Master Schedules for Integration of IUID Functionality with Their Enterprise Resource Planning Systems

to integrate IUID with its Enterprise Resource Planning system for Supply, and will not be ready to share or use UII across its systems—or with other components' systems—by the end of fiscal year 2015. Further, they explained that the Navy was not actively integrating IUID with its Enterprise Resource Planning system for Supply because strict budget conditions compelled Navy leadership to allocate funds to programs the Navy considered to be of higher priority than IUID implementation. As of April 2012, the Navy stated that proposed integration efforts remained unfunded.

Because neither ODASD(SCI) nor the components have complete integrated master schedules for the integration of IUID functionality with their Enterprise Resource Planning systems, DOD cannot reliably predict when it will be able to use these systems to meet its fiscal year 2015 goal to use UII data in intensive item management and product life cycle management. A key internal control is the use of performance measures, and we have previously reported that such metrics for a program's main efforts—including interim milestones and schedules—give decision makers the information needed to assess progress and estimate realistic completion dates.⁶⁶ In addition, we have reported that a reliable schedule—such as an integrated master schedule—is crucial to estimating the overall timeline and cost of IT programs, including Enterprise Resource Planning systems. An integrated master schedule is the time-phased schedule DOD and other agencies use for assessing technical performance. It contains the detailed tasks or work packages necessary to ensure program execution. Further, we have reported that without fully integrating the distinct activities that make up an IT program with such a schedule, an organization will not be able to measure its progress toward completion and cannot be held accountable for results.⁶⁷

Although the Army has integrated master schedules for its two Enterprise Resource Planning systems, these schedules lack key elements, such as distinct activities for IUID integration and detailed processes for transmission of UII data across the systems. The Air Force has an integrated master schedule for its Enterprise Resource Planning system, and this schedule has distinct activities for IUID integration. However, as previously discussed, the Office of the Secretary of Defense and the Air

⁶⁶ [GAO/AIMD-00-21.3.1](#) and [GAO-08-883T](#).

⁶⁷ [GAO-11-53](#).

Force are in the process of evaluating whether to modify, or cancel and replace, the Air Force's Enterprise Resource Planning system. According to Air Force officials, the system's current schedule will need to be revised once the future of the system has been determined. The Marine Corps has an integrated master schedule for its Enterprise Resource Planning system, and Marine Corps officials have stated that they plan to amend the schedule to include distinct IUID activities. However, as of January 2012, it did not contain them. As discussed previously, the Navy is not actively integrating IUID with its Enterprise Resource Planning system for Supply and does not have an integrated master schedule for integrating IUID with its Enterprise Resource Planning system. ODASD(SCI) has produced an IUID timeline that contains general targets for the fielding of IUID-capable Enterprise Resource Planning systems. However, an ODASD(SCI) official stated that it does not have an integrated master schedule to coordinate or track the progress of the components' efforts to integrate IUID with their Enterprise Resource Planning systems. Officials from ODASD(SCI) and several components have reported that they are unsure of when the components' Enterprise Resource Planning systems will be able to share UII data within their networks, a key capability for both intensive item management and product life cycle management.

Given the challenges ODASD(SCI) and the components face in sharing UII data enterprisewide and integrating IUID with their Enterprise Resource Planning systems, DOD likely will face difficulties in meeting its IUID integration goals. Without fully defined requirements; resolving the challenges posed by the Air Force and the Navy not actively integrating IUID with their Enterprise Resource Planning systems; and an integrated master schedule that includes IUID integration at the component level and at the DOD-wide level, DOD cannot reliably predict whether it will meet its goal to use these systems to manage items through intensive item management and product life cycle management by the end of fiscal year 2015, or predict when these systems will have this capability.

Conclusions

Using UII data could enable DOD to improve accountability and management of equipment and materiel, and increase efficiencies in maintenance, which could potentially result in cost savings in some cases. DOD is in the process of developing a framework for managing and implementing IUID technology, but could benefit from fully implementing best management practices that would enable the department to better determine the costs and benefits of IUID implementation, and progress toward goals. DOD components have

reported marking more than 2 million legacy items, and DOD has made some progress in ensuring that its contractors are marking newly-acquired items with IUID. As of January 2012, though, DOD's implementation of IUID technology faces several substantial challenges. For example, while the components report marking more than 2 million items, DOD does not have quantifiable goals or interim milestones that it can use to assess progress in achieving its fiscal year 2015 goal of marking a "majority" of legacy items, or the task force's goal of marking a "significant" number of legacy items. With regard to items that must be marked by contractors, in the absence of policies and procedures that establish a systematic process for assessing the sufficiency of contractor-supplied data matrices, DOD is unable to determine the extent to which contractors are sufficiently marking items. This limits DOD's ability to ensure that it can track those items. Also, DOD has not fully developed the schedules needed to integrate IUID with existing IT systems, so that DOD can share UII data enterprisewide. This impedes its successful integration of IUID technology with these systems by the end of fiscal year 2015, its stated goal, and prevents the department from determining when it might achieve this integration. At a time when the nation faces fiscal challenges, and defense budgets are becoming tighter, DOD leaders' lack of key information on IUID implementation could hinder sound program management and decision making.

Recommendations for Executive Action

We recommend that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics to complete its implementation and management framework for IUID by incorporating key elements of a comprehensive management approach, such as a complete analysis of the return on investment, quantitatively-defined goals, and metrics for measuring progress. To do so, we recommend that the Secretary of Defense direct the following organizations to take six actions:

- The Under Secretary of Defense for Acquisition, Technology, and Logistics to update the IUID task force report's estimates of costs and benefits by incorporating key elements of a sound investment analysis including a more complete estimate of all associated costs, an appropriate methodology for estimating benefits, and a sensitivity analysis of these estimates.
- The Under Secretary of Defense for Acquisition, Technology, and Logistics, in coordination with the components, develop quantitatively-defined goals for the number of legacy items that may allow DOD to achieve the Task Force's estimate of IUID's potential benefits, by

marking a “significant” number of these legacy items, or meet ODASD(SCI)’s goal that DOD needs to mark a “majority” of these legacy items by fiscal year 2015.

- The Under Secretary of Defense for Acquisition, Technology, and Logistics, in coordination with the components, establish quantifiable interim milestones for marking legacy items that allow DOD to track progress toward its goals.
- The Under Secretary of Defense for Acquisition, Technology, and Logistics, in coordination with the components, track progress using a consistent set of criteria, such as DOD’s IUID marking criteria.
- The components and the Defense Contract Management Agency develop policies and procedures that provide for systematic assessment of the sufficiency of contractor-marked items’ data matrices.
- The Under Secretary of Defense for Acquisition, Technology, and Logistics require the components to examine and report to the Office of Defense Procurement and Acquisition Policy on all types of contracts that should include the acquired-items and government-property clauses.

In addition, to enable DOD to successfully share UII data enterprisewide and integrate IUID functionality with its Enterprise Resource Planning systems, we recommend that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics to coordinate with the military services and the Defense Logistics Agency to take the following two actions:

- Define the requirements for using UII data across DOD and within the components’ Enterprise Resource Planning systems.
- Develop or revise integrated master schedules for the integration of IUID technology with the components’ individual Enterprise Resource Planning systems—and between these systems—across DOD. These schedules should fully integrate distinct IUID activities.

We also recommend that the Secretary of Defense direct the Secretary of the Navy to develop a plan to share UII data enterprisewide.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD concurred with eight recommendations and partially concurred with one recommendation. DOD’s comments are reprinted in appendix III. DOD also provided technical comments, which we considered and incorporated where appropriate.

DOD concurred with our recommendation to develop quantitatively-defined goals for the number of legacy items that may allow DOD to achieve the task force's estimate of IUID's potential benefits. DOD stated that an IUID working group will identify the target population of items that qualify for IUID marking in a list of the items' National Stock Numbers and DOD will track progress in its marking of individual items on this list according to component IUID implementation plans that are due to be submitted to the Assistant Secretary of Defense for Logistics and Materiel Readiness by September 2012.

DOD concurred with our recommendation to establish quantifiable interim milestones for marking legacy items that allow DOD to track progress toward its goals. DOD stated that its IUID working group will establish interim milestones to track the progress of marking legacy assets as part of the development of component IUID implementation plans to be submitted to the Assistant Secretary of Defense for Logistics and Materiel Readiness by September 2012.

DOD concurred with our recommendation to track progress using a consistent set of criteria. DOD stated that progress will be tracked using a consistent set of criteria, once developed by the IUID working group.

DOD concurred with our recommendation to develop policies and procedures that provide for systematic assessment of the sufficiency of contractor-marked items' data matrices. DOD stated that the Defense Contract Management Agency has risk-based assessment policies and procedures in place. According to DOD, these include a review of contracts to determine whether they contain an IUID requirement; surveillance of a contractor's IUID marking; and an IUID checklist that requires agency personnel to examine an item's data matrix. DOD explained that agency personnel assess the sufficiency of a data matrix by electronically reading it with a scanner supplied by a contractor or through a statement of quality from contractors that the agency has determined have adequate quality control. We believe that DOD's concurrence with our recommendation may lead to the components improving their capability to systematically assess these matrices, and that the agency's policies and procedures may assist its inspectors in doing the same. However, our review of the policies and procedures provided by the agency indicate that it does not require inspectors to assess the sufficiency of data matrices in all cases. For example, if a contractor does not provide evidence that it has marked items with sufficient data matrices, and no IUID scanner is available on site, neither the agency's 2009 information memorandum describing procedures for

inspecting contractors' data matrices, nor its IUID checklist, provide an alternative method for inspectors to assess the sufficiency of items' matrices. Because of this, we continue to believe that the agency cannot ensure that the items it inspects have IUID labels with sufficient data matrices, and that it should continue to develop policies and procedures that provide for systematic assessment of the sufficiency of contractor-marked items' data matrices.

DOD concurred with our recommendation for the components to examine and report to the Office of Defense Procurement and Acquisition Policy on all types of contracts that should include the acquired-items and government-property clauses. DOD stated that the components will provide contract evaluation reports—for items meeting any of DOD's IUID criteria, as well as pieces of government-furnished property that meet these criteria—and report on compliance with the requirements to include the appropriate Defense Federal Acquisition Regulation Supplement IUID clauses in contracts.

DOD concurred with our recommendation to define the requirements for using UII data across DOD and within the components' Enterprise Resource Planning systems. DOD stated that the IUID working group will define DOD-wide IUID functional requirements.

DOD concurred with our recommendation to develop or revise integrated master schedules for the integration of IUID technology with the components' individual Enterprise Resource Planning systems—and between these systems—across the department. DOD stated that the components have been tasked to submit revised IUID implementation plans to the Assistant Secretary of Defense for Logistics and Materiel Readiness by September 2012. We believe that such plans could assist DOD in improving its management approach for the implementation of IUID. However, as previously discussed, an integrated master schedule has specific characteristics that make it distinct from an implementation plan. Specifically, an integrated master schedule is a time-phased schedule that DOD and other agencies use for assessing technical performance. It contains the detailed tasks or work packages necessary to ensure program execution. Further, we have reported that without fully integrating the distinct activities that make up an IT program with such a schedule, an organization will not be able to measure its progress toward completion and cannot be held accountable for results. Because of this, we continue to believe that integrated master schedules should be developed or revised for the integration of IUID technology with the components' Enterprise Resource Planning Systems.

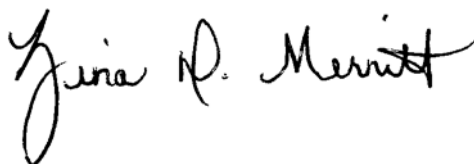
DOD concurred with our recommendation that the Secretary of the Navy develop a plan to share UII data enterprisewide. DOD stated that the Navy—participating in the IUID working group—will develop IUID requirements as part of the working group’s definition of DOD-wide IUID functional requirements. Regarding the specific requirement for IUID functionality in the Navy’s Enterprise Resource Planning system—Navy Enterprise Resource Planning system for Supply—DOD stated that the Assistant Secretary of Defense for Logistics and Materiel Readiness will continue to work with the Chief of Naval Operations (Deputy Chief of Naval Operations [Fleet Readiness and Logistics]) to develop a plan to include IUID requirements in this system.

DOD partially concurred with our recommendation to update the IUID task force report’s estimates of costs and benefits by incorporating key elements of a sound investment analysis, including a more complete estimate of all associated costs, an appropriate methodology for estimating benefits, and a sensitivity analysis of these estimates. DOD stated that the benefits to DOD of implementing IUID marking are to improve asset accountability, tracking, and the life cycle management of targeted items. Further, DOD stated that it will continue to identify costs of implementing IUID as IUID is implemented across DOD. As previously discussed, a best practice for analyzing a program’s return on investment is the estimation of all potential costs, and DOD efforts to continue to identify costs of IUID implementation may be a positive step in this direction. According to DOD, another best practice for analyzing a program’s return on investment is analyzing benefits, and making recommendations, based on relevant evaluation criteria. DOD has estimated that IUID implementation could cost \$3.2 billion, and the components report that they have already spent at least \$219 million on implementation efforts. Moreover, DOD has estimated that implementing IUID technology could save \$3 billion to \$5 billion per year. As previously discussed, DOD may have used a methodology for estimating these benefits that may not be appropriate to the scale and complexity of DOD’s IUID implementation efforts. For example, the task force estimated DOD-wide savings on the basis of a limited number of case studies, these case studies did not address programs that use IUID as the technology that provides a unique identifier to track items through serialized item management, and even when a logistics program experiences cost savings after introducing a new technology or process, it can be difficult to link the savings directly to a specific cause or technology such as IUID. Given IUID’s potential costs and that DOD’s methodology for estimating IUID’s potential financial benefits may not be appropriate, we continue to believe that an estimate of both IUID’s costs and benefits, based on an

appropriate methodology, and a sensitivity analysis of these estimates, would provide DOD leaders with key information to better enable sound program management and determine whether continued spending on IUID is likely to result in a significant return on investment.

We are sending copies of this report to the Secretaries of Defense, the Army, the Navy, and the Air Force; the Commandant of the Marine Corps; and the Directors of the Defense Logistics Agency and the Defense Contract Management Agency. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-5257 or merrittz@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.



Zina D. Merritt
Director
Defense Capabilities and Management

Appendix I: Scope and Methodology

To determine the extent to which the Department of Defense (DOD) has a comprehensive management approach for its implementation of item unique identification (IUID), we reviewed previously published DOD and GAO work to identify best practices;¹ the IUID implementation framework documentation provided by the Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration (ODASD[SCI]); the DOD IUID task force's analysis of the potential costs and benefits of IUID implementation; and the components' estimates of historical spending and fiscal year 2012 budget requests for IUID implementation.

To determine the extent to which DOD components have marked legacy items with IUID, we reviewed DOD criteria for the types of items to be marked with IUID labels; reviewed DOD's plans for marking legacy items; and gathered data on the number and type of legacy items in components' inventories, and how many had been marked as of October 2011. To determine the extent to which DOD has taken steps to ensure that items are sufficiently marked by contractors with IUID, we reviewed the Defense Federal Acquisition Regulation Supplement clauses that require contractors to mark items with labels—or establish virtual unique item identifiers (UII)—and register the items, and we gathered data from the components on the quality of contractors' IUID data matrices.

To determine the extent to which DOD has integrated IUID with its enterprise information systems, we reviewed our previously published work on best practices for the planning of large-scale information-technology efforts;² reviewed DOD-wide and component-level policy on the use of UII data in its information technology systems, which include DOD Enterprise Resource Planning systems; reviewed DOD-wide and

¹DOD, *Product Support Business Case Analysis Guidebook* (Washington, D.C.: April 2011); GAO, *Drug Control: DOD Needs to Improve Its Performance Measurement System to Better Manage and Oversee Its Counternarcotics Activities*, [GAO-10-835](#) (Washington, D.C.: July 21, 2010). GAO, *Cost Estimating and Assessment Guide*, [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009); GAO, *Afghanistan Security: U.S. Efforts to Develop Capable Afghan Police Forces Face Challenges and Need a Coordinated, Detailed Plan to Help Ensure Accountability*, [GAO-08-883T](#) (Washington, D.C.: June 18, 2008); GAO, *Tax Administration: IRS Needs to Further Refine Its Tax Filing Season Performance Measures*, GAO-03-143 (Washington, D.C.: Nov. 22, 2002); GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: Nov. 1999); GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June, 1996).

²GAO, *DOD Business Transformation: Improved Management Oversight of Business System Modernization Efforts Needed*, [GAO-11-53](#) (Washington, D.C.: Oct. 7, 2010).

component-level integrated master schedules for the integration of IUID technology with these systems, if available; and reviewed other types of existing schedules and system planning documents.

In addition, we visited selected sites to observe key IUID activities. To select the sites we used a nongeneralizable, judgmental sample based on a number of criteria, including DOD component and the type of IUID activity performed at the site. For all our objectives, we interviewed officials knowledgeable about DOD's IUID implementation efforts, including officials from ODASD(SCI), as well as other officials from the Office of the Secretary of Defense, the components, and the Defense Contract Management Agency.

We assessed the reliability of all computer-generated data provided by DOD for each of our objectives by reviewing existing information about the data and the systems that produced the data and by interviewing agency officials knowledgeable about the data to determine the steps taken to ensure the accuracy and completeness of the data. In the course of our assessment, we reviewed estimates provided by the components on the number of legacy items marked and to be marked; deficient data matrices; and historical and requested IUID spending.

- Each of the components provided estimates on either the number of legacy items marked, or to be marked; several of the components provided estimates of both. On the basis of our review of the sources and methodology used by the Army, Marine Corps, and Air Force to produce estimates of the number of legacy items they have marked, we determined that these data are sufficiently reliable for the purposes of reporting the components' best estimates of the size of this population of items. The Navy was not able to estimate the number of legacy items it has marked; the Defense Logistics Agency reported that it has not marked legacy items. Based on our review of the sources and methodology used by the Marine Corps and Air Force to produce estimates of the number of legacy items they must mark in the future, we determined that these data are sufficiently reliable for the purposes of reporting on the components' best estimates of the size of this population of items. As previously discussed, the Army, Navy, and Defense Logistics Agency explained that their estimates on the number of legacy items that must be marked in the future are not complete. Although not complete, we determined that the data on legacy items represent the components' best estimates, and are sufficiently reliable for the purposes of

reporting on the general size of the population of legacy items they must mark in the future.

- The Army, Navy, and Defense Logistics Agency did not provide data on deficient data matrices; the Marine Corps and Air Force did provide these data. We reviewed the data sources and methodology used by the Marine Corps and Air Force to produce data on the number of deficient data matrices they have discovered through their review of a portion of data matrices on newly-acquired items in their inventories. We determined that these data are sufficiently reliable for the purposes of reporting on the percentage of data matrices that these components classified as deficient, out of the portion of data matrices in their inventories that they have assessed for sufficiency.
- The Defense Logistics Agency did not provide estimates on either historical or requested IUID spending; the Army and Navy provided estimates on historical IUID spending; and the Marine Corps and Air Force provided estimates of both historical and requested IUID spending. We discussed with component officials the sources and methodology they used to produce the data on their historical IUID spending and fiscal year 2012 budget requests for IUID spending. The Marine Corps and Air Force provided data on both their historical and future spending. On the basis of our review of their sources and methodology for producing these data, we determined that the spending data provided by the Marine Corps and Air Force are sufficiently reliable for the purposes of reporting on these components' historical spending and fiscal year 2012 IUID budget requests. As previously discussed, Army and Navy officials explained that their estimates on historical IUID spending are not complete. Although not complete, we determined that these data represent the best estimates of the Army and Navy on their historical IUID spending, and are sufficiently reliable for the purposes of reporting on the historical spending data that are available.

Appendix II: Key IUID Policy Issuances and Implementation Events, Fiscal Year 2003 to Fiscal Year 2011

2003	<ul style="list-style-type: none">• OUSD(AT&L) issues first policy on IUID, directing components to collect unique item identification (UII) data
2004	<ul style="list-style-type: none">• DOD requires inclusion of DFARS clause 252.211-7003 in contracts for contractor-marked acquired items• OUSD(AT&L) issues IUID policy for marking legacy items
2005	<ul style="list-style-type: none">• OUSD(AT&L) updates policy on contractor-marked government-furnished property
2006	<ul style="list-style-type: none">• DOD components begin marking legacy items with IUID
2007	<ul style="list-style-type: none">• OUSD(AT&L) issues DOD Directive 8320.03 establishing requirement to have IUID capabilities in certain information-technology systems• DOD issues DFARS clause 252.211-7007 in contracts for contractor-marked government-furnished property
2008	<ul style="list-style-type: none">• OUSD(AT&L) issues DOD Instruction 8320.04, which establishes IUID marking standards
2009	<ul style="list-style-type: none">• The DOD Joint Logistics Board forms the Logistics Item Unique Identification Task Force with the mission to assess IUID implementation in DOD
2010	<ul style="list-style-type: none">• DOD IUID Task Force publishes report, and OUSD(AT&L) modifies IUID marking criteria for secondary items, on the basis of recommendations from the Joint Logistics Board
2011	<ul style="list-style-type: none">• Office of the Deputy Assistant Secretary of Defense for Supply Chain Integration (ODASD[SCI]) assumes programmatic lead for DOD-wide implementation of IUID• Office of Defense Procurement and Acquisition Policy issues DOD standard operating procedure for assessing the sufficiency of data matrices• DOD IUID Task Force issues revision of estimate of costs and benefits of IUID implementation

OUSD(AT&L): Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics
IUID: Item unique identification
DOD: Department of Defense
DFARS: Defense Federal Acquisition Regulation Supplement

Source: GAO analysis of DOD information.

Appendix III: Comments from the Department of Defense



LOGISTICS AND
MATERIEL READINESS

ASSISTANT SECRETARY OF DEFENSE
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

APR 24 2012

Ms. Zina D. Merritt
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Ms. Merritt:

This is the Department of Defense (DoD) response to the U.S. Government Accountability Office (GAO) draft report, GAO-12-482, "DEFENSE LOGISTICS: Improvements Needed to Enhance DoD's Management Approach and Implementation of Item Unique Identification Technology," dated April 4, 2012 (GAO Code 351612). The Department generally concurs with the report; detailed responses to the nine recommendations in the report are enclosed.

The Department concurs with eight of the nine recommendations, to include defining and tracking the target population of items, establishing and monitoring interim milestones for item unique identification (IUID) implementation, ensuring applicable Defense Federal Acquisition Regulation clauses are included in contracts and applied as required, and developing requirements to be included in the DoD Components' enterprise resource planning systems.

The Department partially concurs with the recommendation that DoD update the IUID Task Force reports' estimates of costs and benefits. The benefits to the Department of implementing IUID marking are to improve asset accountability, tracking, and the lifecycle management of targeted parts. DoD will continue to identify costs of implementing IUID as IUID is implemented across the Department.

We appreciate the opportunity to respond to this report.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan F. Estevez".

Alan F. Estevez

Enclosure:
As stated

GAO DRAFT REPORT DATED APRIL 4, 2012
GAO-12-482 (GAO CODE 351612)

**“DEFENSE LOGISTICS: IMPROVEMENTS NEEDED TO ENHANCE DOD’S
MANAGEMENT APPROACH AND IMPLEMENTATION OF ITEM UNIQUE
IDENTIFICATION TECHNOLOGY”**

**DEPARTMENT OF DEFENSE (DoD) COMMENTS
TO THE GAO RECOMMENDATIONS**

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics, in coordination with the components, to develop quantitatively-defined goals for the number of legacy items that DoD must mark to achieve its fiscal year 2015 goal of making a “majority” of legacy items, and the Task Force’s goal of marking a “significant” number of legacy items .

DoD RESPONSE: Concur. The item unique identification (IUID) working group, comprised of representatives of Office of the Secretary of Defense, Military Services, and the Defense Logistics Agency (DLA), will identify the target population of National Stock Numbers (NSNs), which qualifies for IUID marking. Once finalized, that NSN list will form the basis to track progress of marking individual assets. Legacy items that are included in the targeted population of items will generally be marked through the maintenance process. Progress against the asset population will be tracked against implementation plans to be submitted to the Office of Logistics and Materiel Readiness (L&MR) by September 2012.

RECOMMENDATION 2: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics, in coordination with the components, to establish quantifiable interim milestones for marking legacy items that allow DoD to track progress toward its goals.

DoD RESPONSE: Concur. Interim milestones, to track the progress of marking legacy assets, will be established by the IUID working group as part of the development of the implementation plans to be submitted to L&MR by September 2012.

RECOMMENDATION 3: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics, in coordination with the components, to track progress using a consistent set of criteria, such as DOD’s item unique identification (IUID) marking criteria.

DoD RESPONSE: Concur. Progress will be tracked against these criteria once finalized by the working group.

RECOMMENDATION 4: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics to update the IUID Task Force report’s estimates of costs and benefits by incorporating key elements of a sound

investment analysis including a more complete estimate of all associated costs, an appropriate methodology for estimating benefits, and a sensitivity analysis of these estimates.

DoD RESPONSE: Partial concur. Benefits to the Department of implementing IUID marking are to improve asset accountability, tracking, and the lifecycle management of targeted parts. DoD will continue to identify costs of implementing IUID as IUID is implemented across the Department.

RECOMMENDATION 5: The GAO recommends that the Secretary of Defense direct the components and the Defense Contract Management Agency develop policies and procedures that provide for systematic assessment of the sufficiency of contractor-marked items' data matrixes.

DoD RESPONSE: Concur. Policies and procedures exist and have been implemented. Since 2010, DCMA has established and implemented a documented, systematic risk-based process for assessing the application of IUID marking by the contractors. The IUID process begins with the Contract Technical Review – Quality Assurance (QA) instruction requiring DCMA QA personnel to review contracts to identify whether IUID is required by contract. Then, based on the Risk Assessment – QA process, if the contractor has not demonstrated satisfactory performance in correctly identifying and complying with IUID marking requirements, surveillance of the contractor's IUID process would be performed. An IUID checklist is available with the Process Review – QA instruction for use by DCMA QA personnel, which also includes a requirement to perform an examination of the 2D matrix. DCMA verifies the readability of the IUID marking either by using an IUID scanner, if available, at the contractor's plant (DCMA QA personnel do not possess IUID scanners), or by reviewing the IUID contractor's statement of quality supplied with the shipment when confidence in the contractor's controls have been determined. Contractor IUID-marked supplies are accepted based on positive results of either inspection technique. However, a Quality Technical Information Paper will be issued advising the field of the results of the GAO review and to emphasize the importance of Government Contract Quality Assurance in the implementation of IUID Technology by DoD.

RECOMMENDATION 6: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics require the components to examine and report to the Office of Defense Procurement and Acquisition Policy on all types of contracts that should include the acquired items and government property clauses.

DoD RESPONSE: Concur. The Military Services and DLA will report contract evaluation reports for items meeting any of the defined IUID criteria as well as Government Property requiring IUID. Confirmation of Defense Federal Acquisition Regulation Supplement (DFARS) clause compliance will also be reported.

RECOMMENDATION 7: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics to coordinate with the military services and the Defense Logistics Agency to define the requirements for using unique item identifier data across DOD and within the components' Enterprise Resource Planning systems.

DoD RESPONSE: Concur. The IUID working group will define Department-wide IUID functional requirements, beginning with the establishment of an IUID indicator in the Federal Logistics Information System (FLIS). This new FLIS data element will serve as the trigger to include Unique Item Identification data in logistics materiel management systems and for the use of applicable DFARS clauses related to IUID.

RECOMMENDATION 8: The GAO recommends that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics to coordinate with the military services and the Defense Logistics Agency to develop or revise integrated master schedules for the integration of IUID technology for the components' Enterprise Resource Planning systems – and between these systems – across DOD. These schedules should fully integrate distinct IUID activities.

DoD RESPONSE: Concur. The Services and DLA have been tasked to submit revised IUID implementation plans to L&MR by September 2012.

RECOMMENDATION 9: The GAO recommends that the Secretary of Defense direct the Secretary of the Navy to develop a plan to share unique item identifier data enterprise-wide.

DoD RESPONSE: Concur. The Navy, participating in the IUID working group, will develop IUID requirements. (Reference response to Recommendation 7). Regarding the Navy-specific Enterprise Resource Planning (ERP) requirement for IUID functionality, Assistant Secretary of Defense (L&MR) will continue to work with the Chief of Naval Operations (Deputy Chief of Naval Operations (Fleet Readiness and Logistics)) to develop a plan to include IUID requirements in Navy ERP.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Kimberly Seay, Assistant Director; Emily Biskup; Cindy Brown Barnes; Cynthia Grant; Neelaxi Lakhmani; Jason Lee; Alberto Leff; John Martin; Charles Perdue; Carol Petersen; Karen Richey; Darby Smith; Chris Turner; Cheryl Weissman; and Michael Willems made key contributions to this report.

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